ARCHIVES OF OTOLOGY.

ELECTROLYSIS IN THE DESTRUCTION OF ORGANIZED STRICTURES OF THE EUSTACHIAN TUBE.[1]

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ELECTROLYSIS in the Eustachian tube was first used in 1888, by Cumberbach and W. S. Stevenson in London, and a report of their work favorable to the method appears in the *Lancet* for November of that year. Politzer simply mentions having used it in one case. In the *New York Medical Record* for December, 1898, Dr. Robert Newman of this city mentions having used it with good results. As the bougie electrodes used in London and also that of Newman are described as extending only one inch beyond the tip of the catheter, it is evident that one of the most important steps in the technique of this procedure must have been impossible, viz.: the introduction of the bougie into the tympanic cavity. In the *American Journal of the Medical Sciences* for April, 1900, a paper is published on this subject by Dr. Arthur B. Duel of this city, in which he reports a series of fifty cases, and concludes, after nearly three years' observations, that in restoring the patency of strictured Eustachian tubes, it is the most rapid and efficient of all known methods.

It is the purpose of the present writer to present roughly the histories of a few typical cases helped during last winter and spring, to report as far as possible on their present condition, and to bring up for discussion some points on the

[1] Read at the meeting of the Section on Otology, New York Academy of Medicine, January 9, 1901.

general subject which have occurred to him during his experience with this method.

It is hardly necessary to go into the etiology and pathology of these strictures. You will recall that they are the result of inflammatory processes characterized in the beginning by hyperæmia and stasis, vascular non-resolution, then migration of round cells into the resulting exudate, and lastly, the organization of the latter into fibrous connective tissue. They may also occur as a result of the sclerotic form of inflammation which is characterized by the formation of cicatricial tissue from the beginning. They may be the result of inflammatory processes extending into the tube from pharynx or tympanum, or of processes occurring independently within the tube itself. In any case the inflammatory deposit may occur at one or several points in its course. Owing to the vascularity of its lining at the tympanic orifice, the tube is particularly likely to be occluded at this point, a fact demonstrated frequently in the manipulation of the electric bougie.

Within the tympanum the different forms of inflammatory products are described as hypertrophies of its lining membrane, and the formation of binding cords and bands, "strings and bridges" between its structures. It is evident that these may stand in the way of improvement even after patulous tubes have been established. It is evident also that when we come to study the effect of the negative electrode upon obstructing tissue within the tube we must also consider the possibility of similar effects within the tympanum.

The above then constitutes a general view of the conditions leading up to Eustachian stenosis with which we have to deal. It is easy to see how in victims of this condition, the well-known row of symptoms, deafness, tinnitus, vertigo, and all kinds of peculiar and distressing head sensations, may be produced, according to the duration and the degree of the stenosis and the extent to which it has disturbed the relationship along the line through tympanum and internal ear.

The early exudate may be expelled by persistent inflations, and the ordinary bougies may aid in the dissolution of

freshly formed inflammatory tissue, but when we come to deal with the tough, leathery, non-vascular, resistant, and well seasoned obstruction, we meet with an unyielding front which gives way only when the entering bougie is made the negative pole of the battery. The writer would not be here understood as limiting the efficiency of this method to the latter form of obstruction, for he believes, in careful hands, good results may follow its use in fresh formations. Our experience has been, however, more with cases of long standing.

These old cases are those which have gone the rounds of the specialists and pseudo-specialists, and exhausted all the means of relief advertised in the newspapers and magazines.

The method of treatment was that originally advocated by Dr. Duel, and is familiar to most of you through the papers already published on this subject. Briefly, the instruments consist of an ordinary silver Eustachian catheter wound with rubber tissue for insulation. The bougie is of gold wire, with an olive tip one to two millimetres in diameter and of sufficient length to extend one and three quarters inches beyond the catheter tip. The Edison 110-volt current is usually available for this purpose, but must be under perfect control, with a volt selector and a milliampèremeter. The wire bougie is made the negative electrode, while the positive is the ordinary contact electrode held in the hand of the patient. With the catheter in good position, the bougie is passed through it into the Eustachian tube until the obstruction is met. Having selected the number of volts required, usually thirty to thirty-five, a current of one and one-half to three, four, or even five milliampères is turned on while the tip of the bougie is held firmly in contact with the obstruction. Within a fraction of a minute usually, sometimes longer, according to the extent of the stricture, the bougie passes through and is felt free in the space beyond. This process may be repeated several times before the bougie enters the tympanum.

It can readily be seen that with experience in this method, one ought to acquire a *tactus eruditus* which would enable him to *feel* the tube throughout its entire length, and judge

the number and extent of the obstructions present. In the experience of the writer, as the bougie passes through, some feel short and annular, others long and even tubular, and these different forms may be felt close together or at widely different points, from the pharyngeal to the tympanic orifice. It is interesting to observe in this connection that in some cases presenting distinct signs of Eustachian stenosis the bougie passes freely to the tympanic orifice before it encounters the offending obstruction. On the other hand, the bougie may be arrested in the first quarter inch of its course and further progress be absolutely opposed, until we call the electric current to our aid, when the bougie passes freely through and goes all the way on to the tympanum without further difficulty.

Under these latter conditions of single strictures, especially of long standing, it is obvious that brilliant results are possible, provided the rest of the auditory apparatus is free. When the single stricture occurs at the tympanic orifice, we are liable to be misled in two ways, viz.: the length to which the bougie may enter and still be short of the tympanum, and the fact that, on account of the proximity of the obstruction to the otoscope, our inflations may sound exactly as if the air had entered the tympanum. In such cases we must be guided by experience, for we ought to know from the space between the bougie handle and the mouth of the catheter, that the distance to the tympanum has not been covered, and moreover we have not yet experienced the successive characteristic sensations felt as the bougie moves freely through the tympanic cavity and strikes against its wall. A little courage and persistence on the part of the operator at this point may save the whole process from failure and give to the patient his long-sought relief. The rule is, therefore, to enter the tympanum at the first sitting in every instance possible. Cases will, of course, be met with which will require more than one sitting in which to accomplish this.

The distress caused by this procedure differs in different individuals, and can be kept at a minimum by proper cocainization, proper management of the current, and the

avoidance of severe pressure on the electrode. If the first administration is given with discretion and care, the patient, knowing later what to expect, usually accepts the others without hesitation. A slight feeling of soreness may follow, but usually disappears after an hour or so. Should the patient complain of soreness or pain in the throat, an incriminating kink can usually be found in the bougie, showing that it had been pushed down along the pharyngeal wall,—a process which may closely simulate its passage through the tube.

In cases of recent formation where the vascular conditions are favorable to reaction, a severe closure of the tube with aggravation of all symptoms may come on within the first twenty-four hours, but at the end of that time is usually followed by a clearing-up process, which, aided by inflations, progresses to marked improvement over the original condition. Where the formations are older and the tube lining less vascular, sharp reactions are obviously less likely to occur. The value of inflations for promoting the absorption and resolution of reactions and as a means of giving us knowledge of the exact conditions within the tube is inestimable and they should be practised on alternate days in the intervals between the electrolytic treatments. Before beginning treatment in any case, precaution should be taken to test the current connections and be absolutely sure of the polarity.

While this paper is written from a purely clinical point of view, it has occurred to the writer during his observations that the character of the current and its acceptability to the patient, especially in this region, are matters of sufficient importance to deserve attention. The writer is quite convinced that the chemically generated current is more acceptable than one from the dynamo, and that the central station current, after passing out over the mains, is much more acceptable than a dynamo current generated in the building where the patient is treated.

This process has been objected to as follows: First, that the bougie is crude, being without insulation, and therefore exerts equal electrolytic action at every point of its surface

and that the walls of the tube must suffer in consequence. Second, that the use of the electrolytic process is likely to be followed by recontractions worse than the original, as is claimed to occur in the case of the urethra. Third, that the gold wire bougie electrode is used without exact knowledge of just what it does, and that its introduction into the tympanic cavity is dangerous and may be attended with harmful results. In reply to these objections it may be said, first, that while some current may pass at all points, we have no clinical evidence that there is electrolytic action anywhere excepting at the point of greatest contact, viz., at the olive tip of the bougie. If the current usually used should be confined to the area of this tip, its density would be so great at that point as to be absolutely intolerable in the Eustachian tube. This difficulty might possibly be overcome by reducing the voltage, but the efficiency may also be reduced by this latter procedure. It would seem then that a non-insulated Eustachian bougie, while it may leak harmlessly (and perhaps beneficially) at the sides, and be less scientific, is more acceptable to the patient, and possibly more efficient for our purpose. Second, that there should result recontractions similar to those occurring in the urethra does not seem to me possible, as we are dealing with a non-collapsible tube free from any irritating agent like the gonococcus or the urine, and where the vascular conditions are not favorable for the reformation of stricture tissue after it is once destroyed. Third, while it is apparently possible that the introduction of the wire electrode into the middle ear may be attended with accidents, such as perforation of the drum membrane, dislocation of the ossicles, otitis, etc., none of these have occurred in the writer's experience, and he has no knowledge of their occurrence in any case. Moreover, with this bougie electrode the writer believes the operator should have a better knowledge of what he is doing than with any other in use.

In conclusion, then, the process of electrolysis is described in every book on electro-therapeutics, and in all, the quality is claimed for it of softening and promoting the reabsorption of inflammatory connective tissue, and its successful use

is reported in cases ranging from stricture of the urethra to opacities of the cornea. With the exact electro-chemic phenomena occurring at the point of contact in living tissues it is not the purpose of this paper to deal, as it is presented from a purely clinical standpoint. From this point of view then the writer would venture to give his personal impression, viz., that as the bougie electrode is held against the obstruction and slowly passes through it, the process seems to the operator to be one of liquifaction and lubrication. The bougie having passed, its action becomes an electro-mechanical one, and apparently causes a softening of the main body of the stricture, a shrivelling of its superficial layers, and a process of vascular absorption which may go on for some time afterward.

The following cases were treated by my colleague, Doctor Brandegee, and myself during last winter and spring at the New York Eye and Ear Infirmary, in the clinic of Dr. Dench, to whom I am indebted for his constant courtesy and helpfulness. The cases were selected after a diagnosis of probable Eustachian obstruction was made out from the history, symptoms, physical examination, and otoscopic auscultation. Owing to interruption in service at the Infirmary, all the patients treated, upwards of forty, passed from observation in May last, and have since been without treatment. The following are the histories of some of those who returned in the fall and reported themselves as still enjoying the improvement experienced last winter.

Case 1.—Joseph B., fifty-five years old, specific twenty years ago, has been under treatment in this clinic for more than five years, but complained of constantly increasing deafness in his left ear, distressing tinnitus constant, and a sensation described as that of a wall shutting off his left ear. Inflation of the left tympanum was seldom or never accomplished to his satisfaction, although the otoscope conveyed the opposite impression to the operator, showing, as was afterwards demonstrated by the bougie, that the obstruction was at the tympanic orifice of the tube, and the patient's impression was the correct one. He was having frequent attacks of vertigo and he could no longer hear the ticking of his alarm clock when held close to the ear. Functional

examination.—Upper tone limit, normal. Lower, 128. B C is slightly diminished and referred to the left side. Hears whisper at two feet. With the electric bougie two obstructions were encountered, one just within the pharyngeal orifice, and the other, most important, just at the tympanic orifice. He was bougied three times during the winter at intervals, with inflations between, and with constant improvement. He had practically no treatment during the summer, and only inflations in the fall. Last week, Jan. 4th, he heard as low as 32 (G, Dench fork), normally, whisper at thirty feet, tinnitus scarcely perceptible, and the wall sensation entirely gone.

Case 2.—Mrs. J., forty-six years old, came first to this clinic in December, 1898, complaining of deafness, extreme tinnitus, and vertigo with nausea, of nine months' duration. Her vertigo was now so severe that she never went about without an attendant. Functional examination December 7, 1898. Left ear: upper tone limit is 1.8 (Galton); lower, 64. B C (256), is slightly diminished. Whisper heard at four feet. *Mt.* dull and retracted. After three months of ordinary treatment, her left tube was bougied in March, 1899, with instant and permanent relief of the vertigo and marked improvement in the hearing. The tinnitus persisting, the patient persevered in the treatment in the hope of finally getting relief. She had six sittings during the last winter and spring, but the tinnitus, although changed in character, still persists. At present, Jan. 4, 1901, nearly two years since first treatment, and after nine months without any treatment whatever, she reports permanent relief from vertigo, tinnitus still persistent, and her whisper-hearing distance is now found to have increased from four feet to thirty feet. The relief from such a degree of vertigo, so prompt and permanent, is most remarkable.

Case 3.—Mrs. R., thirty years of age, came to the clinic in March, 1900, complaining of severe tinnitus in her left ear, of one and one-half years' standing. The impairment of hearing is unimportant in this case, although distinct signs of narrowing of the tube are heard with the otoscope. After four weeks of treatment by the ordinary methods, the electric bougie was applied. Stricture was encountered in the cartilaginous portion. Tinnitus ceased at once. December 28th, nine months afterward, she reports that she considers herself cured.

CASE 4.—J. L., forty-six years old, ship steward and grocery clerk, complained of deafness and extreme tinnitus in both ears. He describes the latter as loud buzzing mixed with mosquito sounds in the right, and as throbbing in the left. This followed the taking of large doses of quinine fifteen years ago, and has continued ever since to grow gradually worse. He has now lost his situation in the grocery store because of his difficulty and uncertainty in taking orders. Functional examination, October 9, 1899. Right ear: upper limit, 2 (Galton); lower limit, 128; whisper, one foot; B C increased. *Mt.* dull and retracted, with marginal congestion; tube narrowed. Left ear: upper tone limit, 1.9; lower, 128; whisper, 5 feet; B C increased; *Mt.* dull and retracted; tube narrowed. After four weeks' treatment by the ordinary methods, he was bougied electrically in November, December, and January, once in each month, with the usual inflation between treatments. On February 8, 1900, test shows that his whisper distance has increased from one foot to thirty feet, while his lower limit has gone from 128 to 64 in the right ear, and in the left ear his whisper distance has increased from six feet to thirty feet, and the lower limit has gone from 128 to 32. His tinnitus has practically disappeared. Although without any treatment whatever since May last, his test last week is the same as that of last February, given above, and his improvement is apparently permanent. He resumed his occupation in the grocery store and gives satisfactory service to his employers.

CASE 5.—F. B., butcher's clerk, came to the clinic October 29, 1899. For five years he had been growing gradually deaf, with increasing tinnitus, until now he was about to lose his position because the customers were obliged to shout their orders into his ear, and he was unable to use the telephone. Functional examination—Right ear: upper limit, 3; lower, 128; whisper and acoumeter, 0; ordinary voice, 6 inches; *Mt.* dull and retracted; tube markedly narrowed. Left ear: upper limit, 3; lower, 128; whisper and acoumeter, 0; ordinary voice, 2 feet; *Mt.* dull and retracted, and tube distinctly narrowed. Between October 17 and February 14, 1900, the right ear was bougied three times, and the left once. On the latter date his test showed that his lower limit had gone from 128 to 32 on both sides, his hearing distance for whisper had increased from zero to thirty feet in both ears, his tinnitus has become scarcely perceptible, and he declared that he is constantly improving. One week ago,

on January 4, 1901, almost a year after treatment, his test shows the improvement of February last to be permanent, and he assures us that he now not only hears at the telephone as well as the next one, but that he can distinguish and recognize the different voices of those with whom he does business in that way. He has had no treatment whatever since February last.

CASE 6.—S. G., produce dealer, fifty-six years old, came to this clinic December 18, 1900, complaining of deafness and tinnitus progressive during the last seven years. He has been obliged to retire from business, and complains bitterly of his tinnitus. Functional examination—Right ear: upper tone limit, 2.8; lower, 512; acoumeter, on contact only; whisper, at 2 inches; B C (512 fork) diminished, tube narrowed, and *Mt.* strongly retracted. Left ear: upper limit, 2.6; lower, 512; acoumeter, on contact; whisper, at 14 inches; B C (512) diminished, *Mt.* strongly retracted, and tube narrowed. He has been bougied three times up to March 24, 1900, since which date he has been without any treatment whatever. One week ago, nine months after, his lower limit has gone in the right ear to 64, distance for forced whisper to three feet. In the left ear the low limit is now 64, forced whisper heard at five feet; other tests unchanged. To quote his own words: "The bird singing, mosquitoes, and all that kind of business is all stopped now; I don't have that any more."

Having considered the action of the bougie electrode in its course through the tube we must consider the possibility of a similar action within the tympanic cavity. This possibility suggested itself to my colleague, Dr. McKernon, who has kindly given me the notes of two typical cases from a series of twenty or more in his private practice. It will be noticed that in these cases no Eustachian obstruction was present and the results follow the introduction of the negative pole into the tympanun for periods not exceeding three minutes at each sitting.

CASE 1.—A woman, fifty-four years of age, complained of progressive tinnitus and deafness for fifteen years. Functional examination—Right ear: upper tone limit, 2; lower, 256, whisper distance, 4 feet; *Mt* thin and transparent; and tube admits large volume of air. Left ear: upper tone limit, 2.4; lower, 256; whisper dis-

tance, 6 inches; *Mt* thin and transparent; tube admits a large volume of air. The bougie was introduced into the right tympanum, and contact was made for three minutes, with three milliamperes at thirty volts. The left ear was similarly treated on the day following. Four days after the last treatment the test is as follows—Right ear: upper limit is unchanged; lower limit, 128; whisper, now at 22 feet. Left ear: upper limit, unchanged; lower 32, and whisper now heard at 8 feet. Tinnitus has entirely disappeared. At present (seven months after) the test remains the same and the patient declares she has no tinnitus.

Case 2.—Woman, sixty-two years old, has complained of deafness and distressing tinnitus progressive during the last eighteen years. Functional examination—Right ear: upper tone limit, 2.1; lower, 64; whisper heard at 4 feet, *Mt* thin and transparent, and tube widely open. Left ear: upper limit, 2.5; lower, 64; whisper heard at 6 inches; *Mt* thin and transparent, and tube widely open. Treatment was the same as in Case 1. Immediately after treatment the test was as follows—Right ear: upper limit, 2.1; lower, 26; whisper, 22 feet. Left ear: upper limit, 2.5; lower, 32; whisper, 6 feet. Ten days later the patient was again tested and the whisper was now heard in the right ear at 32 feet and in the left at 11 feet. At present, seven months after, the functional improvement remains the same as at the last test, the tinnitus has entirely ceased in the left ear and is only occasional in the right.

The writer has had no experience in this class of cases, nor can he or his colleagues give any explanation of the process of relief farther than to reason from the electrolytic action in the Eustachian tube. As has been said, it is possible that the action of the electrode in the tympanum may be one of softening and disintegrating the inflammatory products there, and thus producing such changes in tension and the relations between tympanum and labyrinth as to overcome largely the functional embarrassment of inflammatory origin. This class of cases must receive further study later.

Briefly, then, in closing, the writer would offer the following conclusions: (1) That it cannot be foretold exactly in any given case just what result will follow this treatment, as

this will depend largely on two comparatively unknown quantities, viz: (*a*) the vascularity of the tube lining and its toleration of the mechanical and electrical interference, and (*b*) on the degree of tympanic involvement. (2) That tubal obstruction is early present in the great majority of cases of so called chronic hypertrophic catarrhal otitis media, and that progressive deafness, tinnitus, and vertigo, and many of the peculiar and distressing head symptoms may be purely mechanical, dependent upon closure of the tube by an organized obstruction, while the tympanum and its structures are yet free or only slightly involved. Under the latter circumstances brilliant results may follow restoration of the tube's patency. (3) That in any case where Eustachian obstruction has become organized the best means of disintegrating and causing its reabsorption is by the electrolytic bougie, which in rapidity, efficiency, and permanency excels all known methods.

ACUTE OTITIS MEDIA, CEREBELLAR ABSCESS; OPERATION. DEATH FROM MENINGITIS.[1]

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F. S., age 21, single, came to my clinic at the N. Y. Post Graduate Medical School and Hospital February 19, 1900. Family history negative. Had scarlet fever when seven years of age, otherwise in good health. Had good physique. About three weeks previously had suffered from an attack of grip, followed in one week by severe pain in the left ear, which began to discharge after two days.

When first seen he had a profuse discharge from the left ear, with a large perforation in the drum. Two days later, at a second visit to the clinic, the region about the mastoid process had become slightly painful on pressure. He was that day admitted to the hospital ward. He did not seem to be at all ill but for a slight pain about the ear. There was no external redness or swelling. Two leeches were applied to the mastoid bone and considerable blood allowed to flow after the leeches came off. Temperature 99.6°, pulse 80, respiration 20. He passed a very comfortable night, and on the second day a microscopical examination of the pus revealed the presence of streptococci and indefinite diplococci. Hot flaxseed poultices were kept on continuously and the ear was irrigated with hot sterilized boric-acid solution every two hours. Calomel was also administered. There was no pain, but the discharge was still profuse; slight tenderness on pressure over the antrum continued. Urinary analysis was negative. On the 23d, the temperature, pulse, and respiration were normal; no pain. He complained of no pain, the discharge

[1] Read at the meeting of the Section on Otology, N. Y. Academy of Medicine, Feb. 13, 1901.

was free, and the hot-water irrigation was continued. He seemed to be improving, although there was still some pain on pressure over the antrum and tip. On the 6th day of March it was noted that the discharge was streaked with blood.

On March 7th, there was slight bulging in the attic region and the discharge was considerable. Temperature that day at 2 P.M. was 100°. On account of the continued tenderness it was decided best to no longer delay the operation. On March 8th, the temperature was 99° in the morning, but by 11.30 P.M. it was 103°, pulse 104. Slept well, and on the 9th at 9 A.M. Dr. Clemens operated, as I was called out of town.

OPERATION: Pus was found diffused over a considerable area beneath the periosteum and the bone was of a bluish color. There were three very small perforations through the cortex posterior to the antrum. The entire cortex was removed, the walls of the cells were broken down. The whole area of the mastoid was involved. The lateral sinus was exposed to a considerable area in both directions, especially from the knee backwards. There was no sign of pulsation. The antrum contained a small amount of pus, and was carefully curetted and drainage was established. An aspirating needle was passed into the lateral sinus upward and downward, but no blood could be withdrawn. An incision three quarters of an inch in length was now made into the lateral sinus. A profuse flow of blood followed from the upper end. After a brief effort to release any clot from below, the opening was closed with a plug of gauze and the remainder of the wound packed.

The patient returned to the ward in good condition. Later in the day he complained of some pain in the head; was given 6 m. of Magendie's solution of morphine by hypodermic. He passed a fairly comfortable night and the following morning his temperature was 99.4°, pulse 68, respiration 20.

March 11th.—Slept well, fluid diet. T. 100°, P. 96, R. 20.

March 12th.—Slept well, T. 99°, P. 92, R. 20; no discharge from the ear.

March 13th.—Condition the same; the dressings were reinforced.

March 14th.—Dressings were changed by Dr. Clemens.

March 15th.—Slept well; during the day complained of some headache; gave codeia and phenacetin, also cathartic. Headache was localized in frontal region.

March 16th.—Slept well; T. at 6 A.M., 98°, P. 60, R. 16. Wound dressed.

At 6 P.M. on March 16th he vomited milk curds, and later a greenish fluid. At midnight the T. was 98°, P. 58, R. 11; slept well, but wakened with pain at times; some nausea and hiccough. During the night he vomited an eight-inch worm.

March 17th.—Mastoid dressed. Some pus on the surface of the wound, but no pocketing; had slept well, with no vomiting; but little pain; somewhat listless and refused milk. Dr. Valk examined the eyes and reported "no evidence of choked disc; the optic nerves were somewhat hyperæmic, especially the left."

March 18th.—Gave calomel. The patient had severe toothache, which masked other symptoms.

March 19th.—Slept quietly during the night. At 6 A.M., T. 100°, P. 78, R. 11.

During the forenoon of March 19th, passed into a state of coma and could not be aroused. In the afternoon he would occasionally cry out and was momentarily conscious. Dr. Valk examined eyes again, reported that the eye-grounds were normal. Respiration remained slow. At this time I was again away from the city for two days. Dr. Clemens saw him in the afternoon and considered the case at that time inoperable. The temperature was higher. At 10 P.M., T. 100.4°, P. 112, R. 22. The following morning at 6 A.M., T. 105.8°, P. 118, R. 12. He was unconscious except at very short intervals. Urinary examination showed a slight trace of albumin and a few small granular and hyaline casts.

March 21st I saw him again. He was semi-conscious, restless, and noisy. T. 102°, P. 99, R. 24. Examination of the eyes showed the same conditions as previously. I went prepared to operate if there should seem to be any reason for so doing.

Upon removing the dressing I found considerable pus upon the surface of the sinus posterior to the knee. After removing the pus I probed the surface, and to my astonishment the probe passed inward and slightly upward 3½ inches from the external table. Upon removing the probe, pus flowed freely. I then took a bistoury and enlarged

this opening, which of course was directly through the walls of the sinus into the cerebral cavity. Finding that this gave him almost no pain, I decided to proceed without an anæsthetic and consequently made a free opening. The depth of the abscess, together with the direction taken by the probe, forced me to the conclusion that I must be passing directly into the cerebellum. The abscess seemed to be walled in, as the probe could not be passed in any direction except directly inwards. I injected a free quantity of peroxide of hydrogen, diluted one half, with a large syringe into the abscess cavity. Previous to this, however, about three drachms of creamy pus had escaped. The injection was not followed by actual pain, but it did cause severe hiccough for about one minute. After completely cleaning the abscess I gently curetted, especially at the orifice, and then inserted a long rubber drainage tube to the bottom of the wound, pinning the outer end of the dressings.

Following this treatment the patient became much improved. T. 98.8°, P. 88, R. 18. He slept all night and remained conscious. The external dressings were changed every four hours, even during the night, and the abscess irrigated through the tube with a fifty per cent. solution of hydrogen peroxide and followed by further irrigation with sterilized solution of boric acid. The morning report was that the patient stood this treatment well, except that he hiccoughed a few times at the injection of boric acid. During the 23d and 24th he remained conscious and in good condition. The irrigation was kept up every four hours. At one treatment he vomited a little and hiccoughed at every treatment. On the morning of the 24th T. 99°, P. 98, R. 19. On the 25th we began to notice that the tube was pushed out about one half inch at each dressing. At this time the examination of the urine showed a few hyaline casts and a few leucocytes. On the 26th, 27th, and 28th, condition remained the same. On the 29th he became quite noisy and did not take nourishment well, complained of pain in the legs, but he had no perceptible rise of temperature. Was given codeia and bicarbonate of soda. On the 30th was examined by Drs. Collins and Hammond, who gave an opinion that he had a septic phlebitis in the leg ; this gave him but little trouble, except when he

attempted to move it. On the 31st he was much brighter, with improved appetite, although the leg was somewhat painful on motion. There was no external swelling in the leg. On the 1st of April the leg was much improved; mind clear. Patient laughed and joked and begged for cigarettes. Wound seemed to be closing in. T. 99°, P. 96, R. 18. April 2d, 3d, and 4th, continued to improve. Noted on April 5th that the external opening was rapidly closing. Patient begins to sit up in bed and to take nourishment freely. On the 10th he sat up in a wheel chair, wheeling himself about the ward. On the 13th began tonics of strychnine and hemabaloids. No change up to the 19th. Was eating well and sat up all day. He walked considerably, although the left leg was still somewhat painful. On the 20th, tube was removed and used gauze packings.

On the 2d of May we began using moist dressings. Abscess cavity was rapidly filling in. Patient expressed himself as feeling perfectly well—no pain, no fever, walked about the hospital freely and was out of doors daily. This improvement continued, and on the 18th I made a careful physical examination and also examined the wound with great care. At that time I considered him to be a well man physically; the wound was nearly healed, and a probe could only be passed through into the abscess cavity, which discharged almost no pus, and the slight amount which did come seemed healthy in character. I felt that I had kept him in the ward considerably beyond the usual time for keeping these patients. My anxiety to take every precaution to save the case impelled me to do so.

He was discharged on this day and directed to return daily for his treatment and was told that he could resume his work at an early date. He returned daily for his treatment and the reports came to me that his improvement was marked. This improvement continued until the 25th, when he was seized suddenly with a violent headache and persistent vomiting, the headache being mostly frontal. His friends told me that he had eaten immoderately the previous day. His suffering was so severe that he screamed constantly. At 9.30 A.M. on the 26th he was readmitted to the Post-Graduate Hospital; T. 98°, P. 64, R. 18; gave him calomel and codeia. He had almost persistent vomiting. I saw him at 5 P.M. I reinserted the drainage tube as far as I could and irrigated but found no pus. The patient was screaming with pain and rolled about the bed and vomited frequently a bright green

fluid. Dr. Peck examined his eyes and the report was negative. At midnight the T. 99°, P. 60, R. 20. Even with hypodermic of morphine his pain could not be controlled. He was semi-conscious during the earlier part of the night and kept the ward awake the entire night. Early in the morning of the 27th I went to the hospital prepared to operate provided there should seem any reasonable indication for operative interference. The early morning temperature was 99°, P. 50, R. 16. Upon my arrival at the hospital I found that he had suddenly gone into a state of coma and died.

AUTOPSY, May 27, 1900, by Dr. Henry T. Brooks: On removing the calvarium the dura was found to be slightly adherent along the mesial borders of the hemispheres. The whole external surface of both hemispheres was covered in rounded areas with purulent exudates measuring about 2½ *cm* in breadth. On removing the brain, an orifice, about 1 *cm* in diameter, was seen in the base of the skull on the left side at a point corresponding to the mastoid process. This orifice communicated externally with the wound of the mastoid bone and internally a probe passed through the orifice was found to enter the left lateral lobe of the cerebellum. There was at this time no abscess cavity, but an opening remained large enough to introduce a probe. An incision was made into the cerebellum at a point opposite the opening in the skull which exposed an irregular blood-stained area, extending inward about 2 *cm.*

Microscopic examination of the brain tissue from the posterior portion of the cerebellum opposite the perforation in the bone showed nothing but meningeal infiltration with polymorphonuclear leucocytes. The brain tissue beneath this inflammatory area showed diffuse softening, an irregular area of translucent homogeneous tissue.

Cocci were found in the meningeal exudate. A more extensive examination of the brain tissue showed, in preparations just completed, innumerable streptococci in the depth of the brain substance. These micro-organisms were without much doubt streptococci pyogenes.

MASTOIDITIS COMPLICATED BY PARALYSIS OF EXTERNAL RECTUS.

By Dr. KASPAR PISCHEL, San Francisco, Cal.

W. G., thirty-four years old. Four months ago, abscess in both ears; right broke, left was opened. Feels as if right ear was going to have another abscess.

Hearing: R E, watch, 0.04 *m;* whisper, 3 *m;* voice, 75 *m.* L E, watch, 2 *m;* whisper, 75 *m.*

Right ear—catheter, moist râles; drum: no reflex, not swollen. Diagnosis: otitis media chronic of right ear. Treatment: inflations through catheter.

During the first week the hearing improved somewhat. Watch, 0.20 *m;* whisper, 3.5 *m.*

On the 13th day, however, patient complained of pain in right side of head. Some swelling in front of ear. Mastoid slightly sensitive to pressure. Drum bulging out. Temperature, 100°. Paracentesis membranæ tympani.

15*th* day.—Mastoid only slightly sensitive to pressure, just noticeable œdema; from paracentesis wound, muco-purulent discharge; temperature at 2 P. M., 99.8°.

16*th* day.—Evening temperature, 100°.

17*th* day.—Patient complains that he sees double since yesterday. Paralysis of external rectus. Right eye can be moved out only slightly beyond centre; fundus, veins somewhat congested. Pulse, 2 P. M., 102, temperature, 101.3°.

At 4 P. M., *Operation:* Mastoid cells only congested, very small; antrum full of pus; opening of middle fossa above antrum and attic to the extent of about ½ inch by ¾ inch. Iodoform gauze; bandage.

During the next nine days the fever gradually went down to 99.2°. Then it rose again gradually so that about seventeen days

after the operation it was normal. During the next weeks however the temperature would always rise again to 100° at intervals of a few days. Forty-one days after operation, patient again had temperature 100°, and the communication with middle ear had been closed for a few days. As a little pus always came from depth of mastoid wound, the latter was enlarged under chloroform, the whole mastoid process removed, and the sinus exposed. When scraping out a very deep-seated cell with spoon a profuse hemorrhage occurred, which was stopped with iodoform gauze.

About four months after first operation, the hearing was: Watch, 0.15 *m*; whisper, 75 *m*. Patient still saw double from 45° temp. to 90° temp. of right side. Hyperphoria of right eye, 3°; esophoria, 12°. Seventeen months after operation the hearing was: watch, 40 *m*; whisper, 75 *m*; the vision: R. eye: —5 ⌒ cyl. —0.75, 75° N. $\frac{5}{5}$; L. eye: — 5 ⌒ cyl. — 0.25 H. $\frac{5}{5}$. R hyper-, phoria, 1°; no horizontal deviation.

Eight months after the first operation some small cells of the mastoid containing pus had to be scraped out. The microscopical examination by Dr. Ph. K. Brown revealed staphylococcus pyogenes albus. A few weeks afterwards wound was closed.

ACUTE MASTOIDITIS, THROMBOSIS OF LATERAL SINUS, PERFORATION INTO PHARYNX.

By Dr. KASPAR PISCHEL, San Francisco, Cal.

J. B., twenty years old, came to my office April 21, 1898, for treatment of right ear, giving the following history: About a year ago abscess in right ear; three weeks ago again, ear discharging for about a week. For the past ten days, with exception of the last three days, pain behind right ear.

Status præsens: Left ear, hearing: watch, 2 *m;* whisper, 4 *m;* voice, 75 *m.* Right ear, hearing: watch, 0.60 *m;* whisper, 4 *m;* voice, 75 *m.* Drum slightly bulging, injected.

Diagnosis: Otitis media catarrhalis aur. dext.

Treatment: Catheter.

Three weeks later: Hearing: L E, watch, 3 *m;* whisper, 75 *m.* R E: watch, 0.70 *m;* whisper, 75 *m.*

Six months later: L E: watch, 5 *m;* whisper, 75 *m.* R E: watch, 1 *m;* whisper, 75 *m.*

As the right faucial tonsil was decidedly enlarged, this was removed by electro-cautery seven months after his first visit.

August 1, 1900.—Patient and his mother were accompanied to my office by their physician who furnished the following data: five weeks ago both had severe cold and earache with fever. (I operated upon the mother at once for left mastoiditis with uneventful recovery.) Right ear of son discharged until five days previous to my seeing him. The morning of his visit there was again a bloody discharge. During last week had several chills, severe pain in right ear; fever: mornings, 101°; evenings, 102°.

After cleaning out external ear, which was filled with matter, I found drum bulging out, thickened; therefore paracentesis; a large quantity of sticky matter escaped. There was no sensitiveness or swelling of mastoid region; but patient had difficulty in

opening his mouth. Temperature 104° ; next day afternoon temperature 99.2°. The third day, 7 P.M., patient had chills ; temperature 104.8°, swelling on tip of mastoid and below ; œdema of soft palate ; could not open his mouth ; from right ear copious discharge of yellow-brownish, thick matter with "Siegel" apparently not through drum, which was bulging out, but from in front of it where anterior wall showed a yellow spot, like perforation. Neuritis optica existed on both sides ; borders of disc not clear, moderately swollen, veins quite full, all vessels tortuous. At 10 P.M., *operation.* T-shaped cut along sinus, clearing tip. After removal of a few layers of cortex brownish pus streamed out in great quantity. Probe showed large hole over 1 *cm ;* curetting ; considerable bleeding. After removing overhanging bone, sinus lay open, filled with yellowish thrombus which I scooped out. Iodoform gauze.

Four days later : Dressing ; from jugular fossa copious pus discharge ; washed out with peroxide. Pressure in region of internal jugular vein brought more discharge.

Six days after operation : Ligature of internal jugular vein which appeared somewhat grayish but contained fluid blood. Large swollen gland just in front of vein removed.

Next day : Could open mouth better than before ; no pain in throat ; lower wound looked well ; very little discharge from upper wound ; when syringing jugular bulb fluid enters throat. The following day no longer any communication with throat, and two days later lower wound closed by first intention. Uneventful recovery.

Two months after operation the hearing was : Watch, 1.25 *m ;* whisper, 75 *m.*

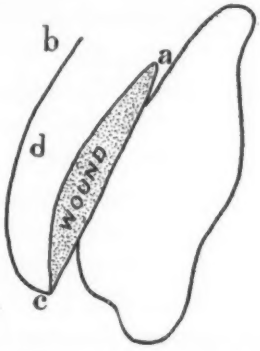
Three weeks after operation the vision on both sides was $< \frac{5}{5}$; field normal ; eleven weeks after operation sight was $< \frac{5}{3}$. While the disc of right eye had become nearly normal a month after operation, the disc of left eye still remains considerably swollen eleven months after operation.

SKIN FLAP FOR IMMEDIATE CLOSING OF WOUND IN THE RADICAL MASTOID OPERATION.

By Dr. KASPAR PISCHEL, San Francisco, Cal.

(With illustration in text.)

IN radical operations for chronic suppuration of the middle ear, if one wants to close the wound right away, I would like to suggest the use of a flap which served me well in the two cases tried. In several cases I used as a flap the skin between the wound and the border of the hair, which flap was laid in the mastoid trough created by the operation. If the flap had the base on top, it covered the roof of the mastoid wound. If the base was below, it covered the posterior wall adjoining the flap made by the external meatus. The permanent opening which was thus created was closed later by freshening the margin of the skin surrounding the hole, and stitching it together. In two cases, to avoid the permanent opening behind, I used the following method: flap *a c b* was formed out of the skin behind the wound; on the upper part of this flap *a d b* the superficial layers of the skin were removed and the wound closed so that *c* lay in the attic; *a* united with skin



behind *b*, so that *a d b* rested on the flesh of the anterior border of the wound and united with it. If the epithelium had not been removed union could not have taken place.

THE DIAGNOSIS AND TREATMENT OF OTITIC MENINGITIS.

By Dr. HINSBERG, of Breslau.

Translated and Abridged by Dr. Edwin M. Cox, of New York.

OF all intracranial conditions, meningitis offers the most unfavorable prognosis, but it is not certain whether this is so on account of the normally fatal intrinsic qualities of the disease, or because our knowledge and resources are not yet sufficient to cope with the disease properly. Upon this aspect of the question much has been written in the past few years, and there is still much in doubt. I should like to offer a few cases bearing upon this question, some of which I observed in the Poliklinik, and others I publish with the permission of Dr. von Mikulicz-Radecki.

The normal structure of the membranes of the brain is well known and need only be referred to (Axel Key, Retzius, Gegenbauer).

The subdural space lies between the endothelium of the dura and the outer layer of the arachnoid. The subarachnoid space forms practically a system of communicating lymph vessels, which are the most important channels for the dissemination of infection. The loose subarachnoid tissue is the most frequent seat of the form of suppuration with which we are dealing, though, in rare instances, pus may collect in the subdural space. This depends on the presence of adhesions between the dura and arachnoid, which are formed usually in chronic inflammatory processes in the immediate neighborhood, and are absent when the dura is

suddenly perforated. The extension of the suppurative process may be diffuse over any part of the cerebral surface, or we may find circumscribed collections of pus in the subdural space and in the interstices of the arachnoid. Sometimes the superficial part of the brain is eroded. Macewen[1] mentions four such cases. Autopsy may show that such circumscribed collections may be the later starting-point of a diffuse meningitis.

Brieger calls this form of meningitis "chronic intermittent," and considers it of considerable importance. He gives two illustrative cases which are worth quoting. "The first patient was a man who had had headache for about two years with cholesteatoma of the temporal bone. The pain varied, and there were occasional somnolent periods combined with convulsive movements. Meningitis followed operation, and autopsy showed that the labyrinth was the starting-point of the infection, and that there were many old lesions particularly in the pia of the cerebellum." "The second case was that of a man who had had chronic discharge from the ear, and was subject to repeated attacks of intracranial inflammation, sometimes like brain abscess, and sometimes like sinus thrombosis. The patient was observed for two weeks, during which he complained of pain in the back and head, but had no objective signs of meningitis. At the end of this period he began to have fever, stiffness of the neck and mental dulness, and died in twenty-four hours. Autopsy showed old thickenings in the pia of the middle and posterior cerebral fossæ, adhesions to the dura, and a recent spinal meningitis. The labyrinth was the starting-point of the infection."

Von Bergmann[2] once found the staphylococcus albus in the cerebro-spinal fluid of a patient operated on for porencephalus, and the patient recovered, so that v. Bergmann considers that this form of bacterium does not necessarily cause a fatal meningitis. The exact behavior of others is still undecided. Gradenigo mentions two cases with staphy-

[1] "Die infectiös-eitrigen Erkrank. d. Gehirns." Deutsch übersetzt von Rudloff, 1898.

[2] "Die Chirurg. Behandlung von Hirnkrankheiten," 1899.

lococci in the cerebro-spinal fluid, and I have seen one similar case which recovered. We may agree with Oppenheim that suppurative meningitis is not a disease of one type, and that the character of the infecting micro-organism makes a difference in the course and prognosis. Leutert believes that virulent bacteria cause diffuse meningitis when they penetrate the dura, and ascribes the circumscribed abscesses to a diminution in virulence in the infecting organisms, from decrease in number or power. The condition is analogous to what is seen in the peritoneum, which we know can dispose of infectious material up to a certain point, and this is important in deciding whether it is worth while to remove the primary focus in order to influence favorably the course of an already present meningitis. If we could draw trustworthy conclusions from clinical symptoms as to the extent and character of the anatomical conditions, we should have gained much in the way of therapeutics. We can do this in advanced cases where the meningitis is diffuse, but it is then too late, and we must therefore try to advance our knowledge of the beginning and circumscribed forms of the disease. Oppenheim calls attention to cases associated with otitis media and circumscribed areas of meningitis in the posterior fossa and in the spinal canal. In such instances, the spinal symptoms are most marked. In a case mentioned by Jansen and Oppenheim, with meningitis of the lumbar cord, the only symptoms were anal pain and incontinence of urine and fæces. When there are circumscribed areas of meningitis over the cerebellum all characteristic signs may be absent, though the diagnosis may be made by exclusion. We may cite the following case:

R. S., aged nineteen. Has had discharge from ears for a long time, and during a period of observation had remittent fever and dizziness, especially in the morning. October, 1899, right auditory canal filled with granulations and a fistula on the left side in the recessus epitympanicus leading upward. Dizziness persists.

Dec. 2d.—Operation showed right mastoid cells, antrum and tympanum full of granulations, and near the horizontal semicircular canal a shallow depression. The dizziness ceased and the

temperature fell after operation, but the latter soon rose again. There were no signs of an intracranial complication.

Dec. 12th.—The above mentioned fistula was followed into the vestibulum, and freely opened. The dura over cerebellum laid bare, seemed unchanged. Temperature fell after this procedure but rose again in two days, though the only complaint made was of pain in the gluteal region. Two days later the cochlea which was necrotic was removed and the cavity scraped, this process bringing the bottom of the wound almost to the internal auditory meatus. Puncture of sinus and cerebellum negative. Examination soon after this showed bilateral choked disk.

Jan. 3d.—Complained of severe pain in sacral region.

Jan. 5th.—Very restless.

Jan. 6th.—Began to be somnolent and have stiffness of neck and later had sudden collapse with fatal result.

Autopsy showed an old area of meningitis near the internal auditory meatus, and diffuse suppurative leptomeningitis.

In this patient, after extensive exposure of the diseased area in the mastoid, intracranial symptoms (choked disk) persisted, and since sinus phlebitis and brain abscess were sought in vain, the signs must have been those of a meningitis which, in absence of signs of extensive infection, must have been circumscribed. In the hope that the suspected focus near the internal meatus would heal after operation, no further attempt at operative work was made, and this plan seemed to be successful until at the end of two weeks meningitis suddenly developed and proved fatal in twelve hours. The result of the autopsy is mentioned above.

The fact that choked disk persisted without other signs of intracranial trouble of any kind was of assistance in making a diagnosis.

In another case, severe headache for days and then suddenly the signs of diffuse meningitis, fatal in twenty-four hours, were the signs. The history of the case is as follows:

W., æt. forty-two, had acute left otitis media; operation one month after beginning of illness; antrum exposed by operation, and one month later the mastoid cells were opened and the sinus and the dura exposed to a considerable extent. They

seemed normal. The sinus was injured and the wound had to be packed. The headache gradually got better and the wound progressed favorably until it was reduced to a small fistula. Soon patient began to have drawing sensations on the left side of the head. Eyes normal. While he was returning home one evening, he began to have vomiting and severe headache, and his temperature rose to 37.5° C. He lost flesh, had vomiting, and sometimes a chill. Pulse, 70.

A diagnosis of brain abscess was made. Operation did not show such a condition, and the patient died delirious in a few hours.

Autopsy showed a purulent thrombus at the point where the sinus was wounded, and there was a small gangrenous spot in its wall which was the starting-point of a diffuse leptomeningitis.

Lucae (*Berlin. klin. Woch.*, 1899, No. 23) has reported a case of otitic disease in which a diagnosis of beginning meningitis was made, and an operation done. The dura was found greenish in color with a gangrenous spot, and some pus was evacuated. Incision to a depth of 1.5 *cm* into the brain substance did not disclose any more pus. The patient slowly recovered.

Jansen in the same journal (1895, No. 35) mentions a case in which it was impossible to say whether meningitis or cortical abscess was present. The patient had had discharge from the ear for years, and suddenly became ill with chill, delirium, and pain when the head was moved. There was also sensory aphasia. Temp. 38.2°. A tentative diagnosis of extradural abscess in the posterior fossa with abscess in the upper posterior part of the left temporal lobe was made and an operation was done. The brain was punctured through the dura and no abscess discovered, but a drop of pus escaped from the needle puncture in the dura, which was then incised. The dura and pia were adherent and discolored. Incision into the temporal lobe was negative, and the patient recovered.

In this case the aphasia pointed towards a cortical lesion which could have been caused by a collection of pus on the cortex or by the pressure of an extradural collection. The stiffness of the neck did not necessarily mean meningitis,

but might have been caused by an extradural abscess in the posterior fossa. According to Oppenheim, focal symptoms are not uncommon in cases of circumscribed meningitis, but signs of involvement of the internal capsule and the optic tract do not occur as in the presence of intracerebral abscess. Pressure symptoms may be present and signs of meningeal irritation are usually not marked. The type of temperature and pulse according to the same author is intermediate to that in abscess and diffuse meningitis. In Macewen's cases of subdural abscess cited above, there were distinct symptoms of meningitis, high temperature, beginning opisthotonos, photophobia, and marked irritability.

The same writer has mentioned also six cases with distinct meningeal symptoms in which operation showed conditions which made him believe that there was circumscribed leptomeningitis.

In a case which we saw there were meningeal signs, and a jugular phlebitis complicated the diagnosis. Lumbar puncture before operation showed diplococci. The following clinical history is of interest:

S. F., æt. thirteen. Admitted July 24, 1899. At age of six had measles, followed by discharge from right ear. In March, 1899, reported that five days previously he began to vomit, had headache, and beginning stiffness in the neck, and was mentally dull. At present, pulse 126, temp. 39.2°, sensorium clear, face flushed; has herpes labialis. The right mastoid is tender on pressure, and there is a tender swollen spot behind the angle of the jaw on the same side. Fetid discharge from right ear. Left pupil wider than right; movements of head painful and neck stiff. Spleen can be felt. Minute subcutaneous hemorrhages in different parts of the body. Lumbar puncture showed leucocytes and a few diplococci. Operation exposed dura, which was not opened. Incision made into the anterior wall of the sinus, which looked greenish. The thrombus was partially dislodged and free bleeding occurred. It became necessary to tie the jugular vein. This was followed by very bad breathing, apparently due to pulmonary embolism. The patient did well for two days, and then suddenly developed a broncho-pneumonia, from which, however, he slowly recovered. On August 21, 1899, he was allowed to go out with a granulating wound, and his ultimate fate is unknown.

The cases which I have so far mentioned have been those in which the probable diagnosis was made at the time of operation, or before that, by lumbar puncture, and in which there was no complication with cerebral abscess. I have purposely avoided the latter class of cases of localized meningitis, as well as those due to traumatism, since both are not of value in cases dependent upon uncomplicated otitis.

Circumscribed otitic meningitis may progress like a case of beginning diffuse meningitis, and its progress may be gradual, with signs of meningeal irritation whenever there is any extension, though in the meantime all symptoms may disappear. In some cases focal symptoms may make the case simulate one of cerebral abscess. In one of our cases the only symptoms were papillitis and sacral pain, and in another severe headache alone was present.

A positive diagnosis is evidently very often impossible, but it is to be remembered that a circumscribed meningitis may give the symptoms of a diffuse process, and we should, therefore, not be too ready to give a fatal prognosis when a patient is apparently suffering from diffuse meningitis. Oppenheim says on this point: "The difficulties of diagnosis should compel us to make a diagnosis of diffuse suppurative meningitis with great caution. Schwartze emphasizes the fact that severe disturbances of the sensorium, with tonic and clonic spasm of the muscles of the extremities or with hemiplegic signs, tend to confirm the diagnosis, but this is not always the case, and the diagnosis should therefore not be made hastily."

Although a number of instances in which lumbar puncture has been made for diagnostic purposes have been recorded, the exact status of this procedure is not yet settled, and it must be remembered that lumbar puncture is not entirely without danger. Leutert adds to cases already reported a fatal result very soon after the puncture was made; he does not, however, think that the danger is of practical importance. It seems to me, however, that lumbar puncture is of no use in patients who seem practically lost, and that it can only be considered as giving valuable information as to whether a fatal disease is present or not in a small number

of cases. Its employment is, however, not free from danger, and there is no guarantee that, in an otherwise not hopeless case, the last chance is not removed by the puncture. Oppenheim warns us that if the case happens to be one of brain abscess, the fall of pressure caused by the puncture may cause a rupture of the abscess, and furthermore, a localized meningitis may by the operation be caused to extend. There is also no certainty that we can claim trustworthy information to be got by this method which will overbalance the certain dangers.

Another important point in this connection is to decide if possible from the result of the puncture whether a meningitis is diffuse or circumscribed. Some authors, among them Leutert, consider that a negative result means a circumscribed meningitis in the presence of other signs, but others, as Stadelmann, consider only positive results as having any value, and also that even positive results are not always trustworthy. Turbid fluid and increase in albumen do not necessarily mean a diffuse meningitis, though the presence of these conditions in the spinal fluid may be considered a contra-indication to operation. Stadelmann believes that if the puncture shows bacteria in the spinal fluid, the meningitis is general, though our three cases do not support this view, so that the presence of bacteria is not of much positive prognostic value.

Gradenigo (*Arch. f. Ohrhlk.*, Bd. 47, 155) reports three cases all of which recovered in the presence of all symptoms of diffuse meningitis, and in two of which lumbar puncture showed turbid fluid from which staphylococci were cultivated. In one case a mastoid operation was done. In regard to lumbar puncture, we may sum up as follows: when the cerebro-spinal fluid is clear and sterile, diffuse meningitis is very improbable, but a circumscribed inflammation may be present; moderate turbidity and some bacteria do not always mean a hopeless condition; marked purulent turbidity shows the presence of a diffuse process practically hopeless, and rendering operation useless.

Most of my experience has been with the subacute forms of purulent meningitis, and it is certain that in some pretty

extensive cases recovery can occur. Macewen operated upon five cases belonging to this class and one recovered, and Gradenigo's cases, mentioned above, also belong in this category. The circumscribed form of meningitis following otitis is certainly not necessarily fatal (Macewen, Lucae, Jansen, Brieger, Röpke, Knapp). The same is true of localized traumatic meningitis. Encapsulated areas of meningitis in the meninges of the spinal cord, and localized areas associated with brain abscess, have been recovered from in a number of reported cases.

I have been unable to find any case of meningitis following otitis in which cure has resulted without operation upon the primary focus, but it seems that occasionally spontaneous cure has resulted. Cases of so-called meningeal irritation in connection with acute or chronic aural suppuration are not uncommon, though such symptoms are often only the precursors of a diffuse meningitis. When the ear trouble is relieved, many such cases will improve and they may be put down as cures from circumscribed meningitis. Some of these cases, however, may be cases of "meningitis serosa," which may subside, or may go on and become purulent in unfavorable cases. I agree with Brieger that too much weight should not be attached to such a distinction.

It is, however, certain that circumscribed meningitis can subside without operation, since autopsy often shows later the presence of "white fibrous thickenings of the pia mater and the arachnoid, sometimes with adhesions to the dura." We must also mention as a kind of spontaneous recovery, what occurs in those cases which are operated upon for ear disease, and in which a circumscribed purulent meningitis is often present, which after operation is undoubtedly cured by resorption of inflammatory products. Some cases have been cured by incision of the dura, where the process was localized.

An exact answer to the question as to what degree the operative intervention was responsible for the cure cannot as yet be given.

In my opinion, however, certain conclusions can be drawn justly. The occurrence of a circumscribed area of meningitis

is always dangerous to the patient, since it not uncommonly may be the starting-point of a diffuse process, and furthermore we are unable to say beforehand in which cases such a thing is liable to occur. It is therefore necessary in all such cases to assist nature in every possible way, either by removing the primary focus in the otitic process, or if necessary by incising the dura in the proper region. The removal of the primary focus is always a matter of much importance, since it is the manufactory of infecting material, and thus tends to cause the process to become diffuse. This removal of the primary process has been successful in many reported cases (Gradenigo, Brieger, and Case 3 in this paper). Some writers (Macewen, Lucae) have reported good results from incising the dura in cases of this class.

We must remember that when we incise the dura only a small portion of the pus is evacuated even in a case of circumscribed meningitis, and that the rest of the pus is in the subarachnoid space and shut off from the subdural space, and this remaining pus is the most important element in causing spread of the infection. To get the best results, the arachnoid must also be incised. Such a procedure is usually not mentioned in reported cases, since usually the dura and arachnoid are adherent so that one incision enters both, the arachnoid tissue being analogous to the subcutaneous cellular tissue on the surface of the body. This incision of the dura is perhaps not theoretically but appears to be practically useful, as the results show. In Case 1, mentioned above, we gained the impression that such an incision of the dura would have increased the chances of recovery. There is some danger that, owing to an error in diagnosis, the incision might open uninvolved meningeal areas which might easily become infected. Such cases have undoubtedly occurred but are very unusual.

The following two cases will illustrate incision of the dura. Their histories are briefly as follows:

Case 4.—E. M., æt. fifteen. Has had discharge from the right ear for several years. Almost total destruction of middle ear. Part of malleus remains. Fistula into recessus. Slight discharge. Patient has been in hospital six months; had headache only once, nine months ago. He had, while away from the hospital,

a sudden attack of pain, which diminished when the discharge became free. Soon thereafter chill and vomiting, which were repeated. The right mastoid region not sensitive ; the jugular region only slightly so. A radical operation on mastoid was done April 20th, and pus and cholesteatoma found in large quantities. The sinus was considerably exposed and its wall looked dirty brown in color. The sinus was opened and dark blood, but no thrombus was evacuated. Five days later owing to repeated chills the jugular vein was ligated and the wound was examined. The posterior wall of the sinus looked gangrenous, and the same was true of the neighboring dura ; free incision did not show any leptomeningitis. The patient soon developed a severe pyopneumothorax, which required a resection of the ribs, and from which recovery was slow. Suppuration continued severe in the mastoid region, the brain hernia was enormous and the patient gradually lost ground, dying on May 17th.

Autopsy showed no sign of meningitis. In the bulb of the jugular vein there was a focus of suppuration not reached by operation. Numerous old and recent suppurating foci in the lungs.

Case 5.—G. D., æt. five. When first seen was somnolent ; had large abscess over right mastoid, right facial paralysis, and foul discharge from ear. Temp. 38.7°, pulse 104. Further history and diagnosis impossible. Operation, done at once, disclosed a large suppurating cavity in the mastoid. The sinus and the bulb of the jugular vein were freely laid bare, and a free incision into the sinus evacuated much foul pus. The posterior wall of the sinus looked gangrenous and was also incised. Pus was thus evacuated from the subdural space, and apparently from the arachnoid. During the next two days there were chills and alternating stupor and delirium. The jugular vein was tied, but the child failed steadily and died in two days.

Autopsy showed purulent infiltration of the meninges of the cerebellum. At the point of incision there was prolapse, and the sinus petrosus and sinus cavernosus contained purulent thrombi.

I find that Macewen, Lucae, and Paulsen (*Arch. f. klin. Chirurg.*, Bd. 52) agree with me as to the propriety of incising the dura under such circumstances as are shown in these cases. Many have opposed the plan of operating upon cases in which a diagnosis of meningitis is made, but the attitude of Macewen, Lucae, and Gradenigo is clear

from what has been quoted. Jansen (*Berlin. klin. Woch.*, No. 35, 1895); Joel (*Deutsch. med. Woch.*, No. 8, 1895); Nasse (*Berl. klin. Woch.*, No. 3, 1895), and von Bergmann (*Chirurg. Behand. von Hirnkrank.*) have written upon the advisability of operating in cases of meningitis, without any general agreement. Lichtheim wishes to exclude meningitis by lumbar puncture before operating upon any case of abscess or sinus thrombosis. In our clinic we consider cases inoperable if all the classical symptoms of meningitis are present, or if the cerebro-spinal fluid shows macroscopic turbidity. One or several of these symptoms we look upon as demanding operation upon the original focus as soon as possible. If the dura is found apparently unchanged we wait a while and observe symptoms, but if it looks gangrenous, or if intracranial symptoms develop, it is incised at once, and the wound treated by packing. Of course many cases of this character will be lost, but one of the cases which I have reported represents a success, and I consider the reporting of failures as of as much importance as successes. The diagnostic difficulties are in many cases greater than the technical. The chance, however, of confusing an otitic meningitis with a case of the epidemic variety is, of course, small, but the differentiation of otitic from tubercular meningitis is not so easy, though a decision can usually be arrived at when the patient has been under observation for a short time. Most of our patients have been brought in in very bad general condition, so that accurate conclusions and histories were often impossible. Our experience has been that practically always the histories were incomplete, especially in the case of children, in whom it must also be remembered that a simple otitis media may give rise to symptoms like those of meningitis.

The following cases will illustrate how easily mistakes may be made in deciding whether the aural suppuration is the cause of the meningitis or not. In two of these cases the symptoms seemed to indicate brain abscess, in three we operated under the impression that there was a simple purulent meningitis present. In all, the future course and the autopsy showed a tubercular meningitis.

TWO CASES OF TUBERCULAR MENINGITIS SIMULATING BRAIN ABSCESS.

CASE 6.—W. K., æt. five. Well until eight weeks ago, then free discharge from the right ear began, and ceased after ten days, but the child did not recover his general health. A few weeks after this, attacks of vomiting set in; the patient began to emaciate, complain of headache, and cry out suddenly.

The child was carried to the clinic, where it was seen that there was special weakness of the left leg and left arm. The right membrana tympani was thickened and red; no perforation. Pulse 60. Sensorium somewhat dulled; responds slowly to questions. No stiffness of the neck. Vomits when he stands up. These symptoms were thought to point toward a localized cerebral affection originating in the aural trouble. In the eyes no noticeable swelling of the disks, margins ill-defined, veins distended and tortuous: optic neuritis. Lumbar puncture showed clear fluid.

Operation, December 27th.—Trephining over the squama was done and the dura exposed. It was tense and did not pulsate, and a fairly large canula plunged in various directions discovered nothing. Incision was made into it without result. Wound treated by packing. The patient failed steadily, and died January 8th, comatose, with a high temperature.

Autopsy showed tubercular meningitis; otherwise nothing significant.

CASE 7.—E. K., æt. one and a half. Brought to out-patient department in Jan., 1895, on account of discharge from left ear. Mastoid operation done March 7th, and followed by normal healing. Had cough and diffuse bronchitic râles.

On June 17th, while child was apparently well, he suddenly developed a temperature, was very restless, and then became apathetic. During the same afternoon there began to be convulsive movements of the right arm, the right leg, and right half of the face. The child made no sound and lay with the eyes rolled upwards. The fundus oculi showed the vessels somewhat dilated, but otherwise nothing special. Temp. 38°.

Next day child was admitted to the hospital. Old operation healed externally. Membrana tympani intact, percussion of left side of cranium apparently painful. Urine shows traces of albumen. Convulsive movements repeated from time to time. Stupor most of the time.

The operation of trephining was done, and punctures made without result into the temporal lobe. Death in a few days.

Autopsy. — Tubercular meningitis, tubercular broncho-pneumonia.

THREE CASES OF TUBERCULAR MENINGITIS, ONE SIMULATING OTITIC MENINGITIS.

CASE 8.—K. F., æt. two and a half, admitted to surgical clinic February 26, 1900. History of measles a year ago, followed after several months by discharge from left ear. One month ago, began to have evening temperature, and sometimes vomiting, which became worse.

Child is well nourished, has no stiffness in the neck; reflexes increased; is apathetic, does not respond when spoken to. Lungs normal, except somewhat heightened breathing sound.

Left auditory canal full of foul pus. Large perforation of membrana. Mastoid region negative. Symptoms indicated apparently a beginning meningitis, with the mastoid as the probable origin.

Operation on Mastoid, February 26th.—Mucous membrane of mastoid cells thickened, some pus in antrum. Dura of middle fossa showed no pulsation. Puncture negative. Tamponade. Patient did badly from the first, and died comatose March 2d.

Autopsy showed tubercular meningitis.

CASE 9.—K. B., æt. one. A younger brother had died apparently of tubercular meningitis. The boy himself had had for some time a (left side) discharge from the ear. September 5, 1899, he began to vomit and to have convulsive movements of the extremities. He is anæmic and very dull; occasional inco-ordinate movements of the eyes and nystagmus. Pupillary reflex retained. Hands clenched, abdomen retracted, and submaxillary lymphatics on both sides swollen. Operation done the same day showed some foul pus in the left mastoid cells, otherwise nothing important. The dura of the middle fossa was distended, and puncture brought a turbid serous fluid. This patient died in two days.

Autopsy showed tubercular meningitis, and broken-down tubercles in the corpus striatum, in corpora quadrigemina, in the occipital lobes, and in the cerebellum. Miliary deposits in both lungs.

CASE 10.—P. K., æt. two and a quarter. April 20, 1900. Parents and brothers and sisters all well. Child has had discharge

from both ears for fifteen months. During past four days great mental dulness; mouth drawn to the left. Child is well nourished and has no signs of tuberculosis. Child has tendency to fall to the right. Right facial nerve apparently somewhat paretic. Large perforation in each drum membrane. No stiffness of neck. Probable diagnosis of meningitis starting from the aural disease. Lumbar puncture showed clear sterile fluid.

April 20th, operation on left mastoid. Dura unchanged. Antrum and tympanum full of pus. Mucous membrane thickened. April 24th, operation on right side showed about the same condition as was found on the left.

This child failed steadily, and died on June 30, 1900, and while no autopsy was permitted the case seems to have been one of tubercular meningitis.

Cases 6 and 7 presented much in common. In both children there were no direct signs of tuberculosis and in one the aural discharge ceased spontaneously and in the other stopped after operation. After an interval without symptoms covering several weeks, one child suddenly developed headache and began to vomit, and paralytic symptoms began on the side of the body opposite the diseased ear. This, however, did not last long. In the other child, convulsions occurred on the side opposite the disease, followed by paralysis with some rigidity. In neither case were there definite signs of meningitis. The lumbar puncture done in one case was without result. Operation did no good, and the picture of tubercular meningitis was gradually developed in both cases. The fact that the discharge from the ears was not important at the time of operation did not shut out the diagnosis of brain abscess, and there was nothing in either case pointing definitely towards tuberculosis. Paralyses in different parts are common enough in cases of brain abscess, but are unusual as early signs in meningitis. If it is seen in connection with discharge from the ear, especially when on the opposite side, the diagnosis of abscess is reasonable. In the first of this last series of cases described, one symptom may be described as in favor of meningitis, and that is temporary transitory improvement in the paralysis. In this case

the paralysis of the left side of the body almost disappeared for an interval, and then returned.

In cases of abscesses, however, such changes in the condition of paralysis are possible, as for example in case an abscess cavity should communicate with the middle ear and by partial evacuation so relieve the pressure, perhaps on the internal capsule, that restoration of function would be possible. Such cases must be rare, and the rule is that paralysis caused by abscess does not improve, while in tubercular meningitis such occurrences are not uncommon.

Hirschberg (*Arch. f. klin. Med.*, Bd. 41) and Zappert (*Jahrbuch f. Kinderheilk.*, Bd. 40, p. 170) have discussed the occurrence of focal manifestations as the initial symptom in tubercular meningitis. Hirschberg mentions twenty-nine collected cases and three observed personally, in sixteen of which all signs of tuberculosis were absent, while in thirteen there were pulmonary indications pointing towards a possible meningeal complication. Five patients were children, the rest adults, among whom unilateral paralysis developed gradually in four and suddenly in eleven. Nine patients had localized motor disturbances and in three there was aphasia. Two of the children were hemiplegic, two had unilateral convulsions, and one had aphasia and convulsions. In seven cases there were rapid changes in the motor symptoms, notably improvement. Ten of the patients had more or less fever. The pulse did not show noteworthy changes and in only two cases was there a marked disproportion between the pulse and temperature. In most of the cases it was impossible to make an exact diagnosis, the difficulties of which Hirschberg emphasizes. We cannot depend too much upon the slowed pulse as an aid to diagnosis since it does not invariably accompany brain abscess.

Hirschberg comes to the conclusion from his cases that meningitis in children less often begins with motor disturbances than in adults, though Zappert's figures do not entirely confirm this.

In two of the latter's cases, stiffness of the neck was the first sign which pointed towards meningitis, and he also notices the fact that the paralytic symptoms in meningitis

may improve and disappear after having reached a high degree of development.

We may conclude that among a not very large number of otherwise well persons, paralytic symptoms may be the first signs of a tubercular meningitis, and as a rule it is impossible to make a certain diagnosis under such circumstances. Not infrequently an unexpected improvement may occur in such symptoms, and this appears to me to be characteristic of meningitis.

I have already referred to the occurrence of focal symptoms in tubercular meningitis, and the fact has also been mentioned that localized meningitis of other varieties can sometimes cause the same kind of symptoms. Whether under the latter condition remissions may occur, I am unable to say. It would be interesting to know in how many of these cases of tubercular meningitis there was a history of discharge from the ears.

The combination of discharge from the ear with tubercular meningitis is not very rare, especially among children, as is emphasized by Körner ("Eitrige Erkrankungen"). In our cases this combination has occurred a number of times. Case 10 is of particular interest since the diagnosis was rendered still more doubtful than usual because the discharge was present in both ears. The lack of success after the first operation made us think that the meningitis was more extensive or that it was tubercular.

Although lack of success has attended many of these operations we need not therefore feel discouraged, for we may be certain that our operations have certainly in no way made the conditions of the patients any worse. I have to thank Professor Kümmel for the use of much clinical material.

PRIMARY OTITIS EXTERNA FROM A CLINICAL POINT OF VIEW.

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Translated by Dr. C. Mund, New York.

CLINICALLY, as a rule, external otitis is a primary and in most cases an inflammatory skin-disease, limited to the auditory canal. As the lining of the latter is a continuation of the integument in general, the similarity in the diseases of both is readily apparent, being identical physiologically. Therefore we have the same differentiation in diseases of the skin of the auditory canal as we have in those of the skin in general, viz.: diseases principally of the epithelium (ichthyosis, most pronounced form), and diseases with participation of the corium (dermatitis, mild form, and eczema, severe form). In cases of anomalous secretion distinct symptoms of dermatitis are frequently noticed. I regularly observed them in the monolateral lesions (cases of monolateral recurrence). In many cases of impacted cerumen the cerumen shows an admixture with the products of desquamation of the auditory canal. These circular lamellæ always envelop the dry ceruminous plugs and also are contained within them. After the removal of the plug for some time lamellæ peel from the skin of the auditory canal. In the normal ear we never find a large accumulation of cerumen. Too careful people meddle unnecessarily with the auditory canal in trying to clean it, whereby they are very likely to bring about an external otitis, which results in an anomaly of secretion. Cases in which the epidermis of the auditory canal alone is diseased are rare. They are charac-

terized by the absence of pruritus and lead to the formation of epidermis-plugs. Wreden of Petersburg sometime described this as keratosis obturans. In a case of ichthyosis affecting the entire body, I observed a semi-annual recurrence of formation of epidermis-plugs. The patient was a young man sixteen years of age, from whose ears I removed two plugs. The skin of the auditory canal was in the same condition as the integument of the rest of the body. Perspiration was absent. In some cases of epithelium-disease the products of desquamation consist of small lamellæ, which look like white powder and are situated on the hair of the entrance into the canal. Although these powder-like lamellæ may be removed by means of cotton, desquamation nevertheless soon recurs. A colleague had both ears affected with this form of external otitis. I had him under observation quite a time, as the left ear showed a chronic suppuration of the attic, with a large perforation in Schrapnell's membrane and polypoid granulations on the edge of this perforation. Long-continued local treatment resulted in the formation of a cicatrix with cessation of the suppuration, so that the patient has been well since 1889. In 1897 a large epithelial plug was formed. The patient had not been examined for over half a year, having been free from all symptoms, and this accounts for the large size of the accumulation, which one night finally caused him severe pain. The plug, which was of an enormous size, was then removed. Small epithelial plugs had been removed from his ears before. It is understood that the mistake of diagnosing a cholesteatoma communicating with the auditory canal for an epithelial plug must be avoided. The two differ even in their appearance. Iridescent cholesteatomata occurring in the auditory canal in cases with a healthy and normal middle-ear, have, as far as I know, only been described by Politzer, on page 153 of his text-book; in two of these cases, however, the auditory canal did communicate with the antrum. The diseases mentioned constitute to a certain extent the beginning of the severer forms of dermatitis. The subjective symptoms are wanting, viz.: no itching. Pruritus is the most important and the most distressing symptom of the

severe forms of dermatitis. Among these we have one form in which the skin is dry and remains so for a long time with absence of cerumen and with a great deal of itching. This would correspond to a cutaneous pruritus in which perspiration is often absent. In these cases the severity of itching in the auditory canal acts in the same manner as it does on the integument of the body—that is, it varies at different periods. Pruritus is so often associated with dermatitis that it is very difficult to differentiate which of the two is the primary. In true dermatitis the dry itching skin, as a rule, only represents the one stage (of the disease), which more or less readily changes into the other, the moist one, in which a copious discharge of a clear watery fluid takes place, especially following severe irritation (scratching)—a fact of which many patients inform us. Following this for a greater or lesser period, the dry stage of dermatitis is transformed into the moist form. The disease is a most severe and insidious one; when in connection with eczema and also when occurring in the auditory canal, it is dreaded for its protracted course, which to a great extent is due to the fact that the mechanical insults and the minute infections caused by the severe and lasting itching are unavoidable. In the moist stage of dermatitis the auditory canal contains a greasy, whitish, doughy, bad-smelling substance in place of cerumen. The underlying skin is reddened and in some parts excoriated, but with very little general swelling (except after irritation and in eczema). The troublesome itching induces the patient to scratch, in consequence of which infection results. In the dispensary these cases are in a general way treated as diffuse and circumscribed inflammations of the auditory canal. The skin (of the auditory canal), easily damaged and altered by dermatitis, appears to induce aural conditions favorable for infection. Thus it is an apparent fact, that in general a healthy auditory canal rarely is primarily diseased from these infections. Scratching—infection—produces furuncle and, according to my experience, very frequently suppurative phlegmonous cellulitis in the auditory canal; furthermore pseudo-erysipelas, which spreads all over the entire ear and over the corresponding half of the

head, or true erysipelas; finally chronic and acute infiltrations about the ear, also periostitic abscess of the mastoid process. Evidently the cause of all these lesions without any exception is contact-infection by means of infected instruments, which are used for scratching, such as ear-spoons, hair-pins, coiled towel and handkerchief corners, small pieces of paper, matches, the points of spectacle-frame hooks, cotton swabs, etc. In every instance the patient has admitted having used these instruments for scratching; on the other hand I have very frequently observed that the patient never again suffered from infection after having given up the habit of scratching. The dermatitis in these cases nevertheless continues with varying degrees of intensity. Notwithstanding the intensity of the itching the occurrence of such an infection is remarkably rare. Furthermore the term "otitis ex infectione" includes acute inflammation of the auditory canal with swelling of the surrounding tissues. Patches, bloody from scratching, or localized swellings may be the only manifestations. Pain and anxiety induce the patient to see the physician. If from now on scratching be stopped, then the parts attain rest and, provided infection has as yet not taken place, return to the normal state. In case of infection, however, as a rule a general swelling of the auditory canal ensues quite rapidly. The swelling arrives at its height within twelve hours and is accompanied by severe increasing pain. It is rare for it to come on slowly with but moderate pain and to take from 8–14 days for its development. In that case the infection is less severe, and the skin is more resisting. The result of this is a very irregular and more dense infiltration of the auditory canal. Abscesses are rare in these cases. Both forms finally show the same condition, viz.: auditory canal swollen and containing scales and a greasy substance; drum-membrane more or less intact and reddened. Such swellings—even when of large extent—of acute or chronic origin may go down without formation of abscess or furuncle, especially if proper antiseptic treatment is used. Few of them, however, cannot be checked, and go on to abscess formation. Then an incision has to be made or spontaneous rupture takes place. It is only at this stage

that it is clinically possible to determine whether the case is one of large furuncle or one of ordinary abscess. If it be a furuncle, a core is discharged; or in case of abscess the characteristic round defect in tissue with its necrotic edge is apparent. Small furuncles originate from circumscribed infection, and run their course with but moderate swelling of the walls of the auditory canal. The patient usually suffers great pain until the abscess bursts. The infection may, however, behave like a cold abscess and without pain.

CASE: Patient came to me for treatment March 8, 1897. Swelling of auditory canal of nine days' duration. Sensation of fulness in left ear. Lumen of auditory canal narrowed down to a slit. No pain. Two days later spontaneous rupture of swelling. The patient had been in the habit of constantly using an ear-spoon.

The remaining severe local affections of the auditory canal, viz.: abscess formation, gangrene, caries of the bony walls, as far as they can be considered as having any connection at all with simple dermatitis, or sequelæ of the latter, are brought about by constant maltreatment and by reinfection from the milder forms. They are the misfortune of the poorer class of people, while they do not occur among the better class. Whenever the infection of the auditory canal leads to progressive inflammation, the lesion shows itself rather as pseudo-erysipelas than as progressive phlegmon, which term has without sufficient reason been used for a special form of disease, "otitis ex infectione."

To this category belongs a case, which for a long time had semi-annual recurrences, and which was described by me in 1893, in notes on the translation into the Russian language of Hartmann's text-book on *Diseases of the Ear*. Patient formerly had suffered two or three times a year from such an acute swelling of the face with a simultaneous swelling of the auditory canal and entire region about the ear. When I saw him first (1891) the right side of his face was affected; lumen of auditory canal narrowed down to a slit; concha irregularly swollen, reddened; half of the face puffed up and swollen; relatively little pain; evening temperature above 38° C.; swelling gradually went down within eight days. During this time the following anamnesis was

obtained, viz.: owing to the fact that he had been ailing for a long time, and was in the habit of travelling a great deal, the patient had in his possession a complete instrument case, which contained a variety of drugs and ear instruments, especially all sorts of spoons and small sponges. For a year, probably since childhood, he had chronic external otitis, with a great deal of itching and abnormal secretion. Regularly every 4–6 months he would, by scratching and cleansing, produce the inflammation mentioned above as pseudo-erysipelas. This was his last attack, for once convinced of the real cause of his affection he very carefully avoided all scratching within the auditory canal. The dermatitis, however, continues with quite severe exacerbations from time to time ; for example, during the summer of 1897, when the disease presented the insidiousness and infiltration of an eczema.

I have observed severe erysipelas originating in a similar way within the auditory canal. Another variety are the cases, where an infiltration of the soft parts over the mastoid process takes place in the form of an acute or chronic periostitis, of course with intact middle ear. Pus may form, or the infiltration may go down after long duration.

Case 1.—Painful infiltration over mastoid process extending diffusely over region of neck, of two months' duration. Chronic external otitis. Formerly a great deal of itching ; patient frequently scratched his auditory canal with matches and fingers. Auditory canal now intensely swollen ; middle ear normal ; membrana tympani but slightly reddened ; no otorrhœa. After application of alcohol-compresses within auditory canal and over region of ear the infiltration, which at first was very tender on pressure, subsided within 10 days. Gradual and complete recovery resulted, the swelling of the auditory canal gradually going down under the alcohol treatment.

Case 2.—Girl, fourteen years of age ; painful infiltration, indistinctly fluctuating at time of admission, developed over left mastoid process, within two months, from chronic external otitis. Middle ear normal ; membrana tympani intact ; auditory canal moderately swollen. Formerly patient frequently had used hairpins to allay itching. In right ear no dermatitis, no itching, no trouble of any kind. Incision and scraping of periostitic abscess. Iodoform dressings. Recovery.

The most important difficulty in diagnosing these acute swellings of the auditory canal lies in the exclusion of otitis externa consecutiva (secondary to acute or chronic otitis media), the presence of which indicates retention of pus within the cavities of the middle ear. I have only once seen an abrupt swelling of the auditory canal and of its surroundings in a case of acute otitis media, where the swelling was not due to this cause. I describe the case here, it being a very rare one.

During the third week of an acute otitis media, unexpectedly and abruptly an acute swelling of the auditory canal, and a doughy swelling of the region about the ear, including auricle, appeared; pain but slight in general, moderate rise in temperature. The cellular inflammation soon subsides. For several days the co-existing otitis media made me suspicious of retention of pus. With the rapid subsidence of the swelling, however, this apprehension soon vanished. Subsequently the fact was confirmed, that the patient had been scratching his ear canal with matches for the purpose of allaying itching. This probably accounts for the fact that the infection had originated inside the auditory canal.

In regard to the treatment of these forms of external otitis, three remedies always are sufficient in my hands. These are a medicated oil, a medicated alcohol, and a sublimate solution (1:1000) used for preparing an antiseptic occlusive dressing. Of oils I prefer the oil of thyme, in the concentration of from 1:100–1:1000. This is used in squamous, unirritating dermatitis and is to be instilled directly from the bottle. Cotton must not be retained in the ear-canal. If the oil is to be applied by means of a cotton swab, the patient at the same time must be instructed to disinfect hands and finger nails with alcohol, previous to treatment. The oil, as a rule, will not cake. The skin loses its dryness and attains a smooth, soft surface. The symptoms (itching and slight pain) gradually subside. Oil of thyme also suffices for the squamous stage of eczema and as a rule is preferable to ointments. Bezold condemns the treatment with oil altogether, attributing to it the causation of aspergillus-mycosis. I believe, however, that this needs to

be feared only among the poor. Really I never saw it occur in practice among the better class. Aspergillus-mycosis has but very seldom been met with during a course of oil treatment. The relatively large amount of thyme in it possibly guarded against such a complication. Moreover, it is quite easy to cure an acute case of mycosis by means of alcohol. The advantages gained by the treatment in oil in suitable cases are so pronounced that this method cannot very well be abandoned. Watery solutions of drugs, also pure water, are not well tolerated in dermatitis of the auditory canal, no more than they are in dermatitis of the integument; therefore they are to be avoided. As a remedy for the moist stage of dermatitis alcohol ranks first. It desiccates, allays itching, and disinfects. Its use is general. I use a 10% alcoholic solution of cocaine. Alcohol furthermore has the great advantage, that it can be entrusted to the patient for self-treatment. In combination, under circumstances with the oil treatment (in the squamous stage), it has cured many of my patients, who were residing at too great a distance from me for the necessarily frequent office treatment. When infection from scratching has resulted or is to be anticipated, when perhaps an acute swelling of the auditory canal has made its appearance, then — owing to the happy results obtained by me for the past six years — I recommend to try and disinfect the auditory canal by means of packing it with cotton saturated with bichloride solution. The bichloride solution (1:1000) such as is used for disinfection in general surgery is usually well tolerated by the skin of the auditory canal, even in eczematous cases. In treating the disease of the auditory canal in question, the efficient antiseptic property of the sublimate solution here also is demonstrated by the fact that under its use the inflammations mentioned above subside more rapidly (often without suppuration, which is very likely prevented by it) and that recurrence by reinfection, in case of furuncle for example, is averted. Should formation of pus take place under the antiseptic dressing, we have the advantage at any moment of being able to make an incision in a perfectly aseptic region. With the aid of reflected light and a nar-

row speculum (one not tapering conically), a slender tampon of cotton, saturated with the sublimate solution, is inserted through the narrowed lumen of the meatus into the auditory canal, if possible as far as the drum-membrane. This procedure is often a tedious one, but nevertheless it is the most important part of the treatment. The fatty products of secretion and desquamation having been removed from the auditory canal (by means of a slender probe and syringing through a speculum), we proceed as follows: The tampon having successfully and properly been introduced into the auditory canal, another one, also saturated with the bichloride solution, is placed into the concha, and over this dry cotton is applied. The patient then is instructed to apply (by instillation) a small quantity of the bichloride solution (1:1000) to the tampon of the ear-canal every four hours. For this purpose the outer layer of cotton must be removed. The tampon must not under any circumstances be removed by the patient himself, not even on account of increased pain. I have learned by experience, that as long as the tampon is retained in its place the patient's condition remains a tolerable one, and that impatience only can induce the patient to remove this important means of disinfection, which would protract the course of the disease. The tampon has to be removed from the auditory canal every twenty-four hours by the physician himself. If it be allowed to be retained longer than twenty-four hours, the secretion, which it has absorbed, will cause it to attain a foul odor, even in spite of the bichloride solution. Then pain will arise anew, as I have frequently observed. The latter, however, soon subsided after removal of the tampon. For the relief of pain the patient may take morphine internally and may be allowed to make dry hot applications over the antiseptic dressing. Frequently the swelling goes down after a short time, and pain decreases. Should formation of abscess or furuncle take place, then — as stated above — we have the opportunity to make an incision in an aseptic region. After the incision has been made we must continue with the antiseptic occlusive dressing, by means of which reinfection, even in case of furuncle, as a rule is certain to

be averted. When incision was refused, then the spontaneous course appeared to me to have been less painful to the patient — under the antiseptic occlusion — than formerly without it. The various mechanical irritations on the part of the impatient sufferer are thus also entirely avoided. Spontaneous evacuation of pus through the skin is noticeable under the dressing by a sudden amelioration of the symptoms. In renewing the dressing the pus will be detected on the tampon. Experience teaches how long the sublimate tampon is to be continued. In general it would be injurious to discontinue it too soon. To me, from three to four days seemed to be sufficient. Only in two instances I had reason to believe that the antiseptic treatment had been kept up too long, inasmuch as after discontinuing the same the skin desquamated for a time. This, however, was of no further consequence. In one instance I observed that the prophylactic, the too frequent (hourly for twenty-four hours) application of the bichloride solution, had produced vesicles. The complication disappeared without medication, simply by discontinuing the energetic treatment. Under the sublimate treatment the skin of the auditory canal soon attains a whitish tumefied appearance. Frequently dark discolorations are seen on the surface of the tampon after its removal. In a short time the good effect of successful antisepsis is noticeable. As the swelling goes down, the instillations are to be practised less frequently by the patient. Finally the tampon is allowed to dry and is simply renewed every twenty-four hours until finally it may be done away with altogether. Then for several days the auditory canal is not to be touched in any way. The skin will return to the normal state of itself. I have rarely employed the sublimate treatment in children. Though their skin is more tender and tumefies more readily, I have never noticed any injurious effects from this method of treatment. If any fear of resorption be entertained, the instillations can be used less frequently or in weaker solutions. As a matter of fact I have observed acute swelling of the auditory canal "ex infectione" to occur less frequently in children than in adults. In comparison with

sublimate, other remedies recommended in a similar way have appeared to me to be less effectual. I tried solution of acetate of alum and carbolic glycerin (10°–20°). Of the various drugs in powder, which are used in the moist stage of external otitis, Bezold praises boric acid very highly. Although this has the property of reducing to a minimum the moisture present in the auditory canal, it on the other hand has the tendency to become lodged in the ear-canal either in the form of dry grains or as cohering flat crusts. As these prevent healing, boric-acid powder is unfit to be given to patients for self-treatment. Of late (1899) I have seen two cases of dermatitis in the exacerbation of the moist stage in which only boric-acid powder would do any good, whilst alcohol caused irritation with increased secretion. In regard to the general treatment, we always have to consider that dermatitis of the auditory canal is eminently a chronic disease. I have followed cases with all their mild and severe recurrences for eleven years. These include true eczema as well as simple and mild forms of dermatitis. Both may therefore appear as being incurable. It is only too natural that in treating so persistent a disease as eczema one should try a number of other remedies. Although they occasionally prove successful, I for my part never could see any special indication for any of them, inasmuch as my treatment, mentioned above, answered the purpose to my entire satisfaction, viz.: oil was preferable to ointments, and the most important point was to prevent mechanical insults and infection. Many patients do best without any treatment.

Otitis externa mycotica is easily diagnosed and as a rule subsides readily under treatment with alcohol. Thimble-shaped skin casts and black or reddish-yellow spots are characteristic of mycosis. When their presence is detected, the diagnosis is verified by the naked eye and the microscope. I have seen mycosis only in connection with dermatitis of the auditory canal.

Otitis externa hæmorrhagica, which generally is a traumatic dermatitis, is often associated with myringitis of the same kind and occasionally is caused by bathing. It is of

rare occurrence and shows nothing of special interest, the same, as for example, primary herpes (of the auditory canal) of which I have seen one case.

Otitis externa crouposa primaria is also a very rare disease. The following five cases were observed during ten years.

CASE 1.—Girl, three years old. Measles which ran a normal course. Three days later reappearance of fever, which at first was attributed to constipation, until finally pain in the ear set in. February 15, 1888, consultation. Both auditory canals filled with croupous membranes; these were easily and completely removed by syringing; lumen of canals almost closed by irregular swelling of the walls, which are not denuded of epithelium, but bleed even on the most careful touch with the probe; swelling most marked on posterior part of upper wall. The following two days the temperature reduced (38.3°–38.4°; 37.7°–38.4°); pseudo-membranes removed daily by syringing; no more fever. Six days later, no more membrane; swelling gradually subsides, and recovery progresses favorably; inflation of right ear once gave the whistling sound characteristic of perforation, although the secretion almost always was absent. Fourteen days after beginning of disease the swelling of right side entirely gone; drum-membrane now visible and intact. Eight days later, swelling of left ear, which was more severely affected than the right, also had disappeared; here, in the left ear, we find attached to the posterior part of the upper wall and to the left, close to the membrana tympani, a pediculated polypus; this was removed by means of the cold snare. The operation had to be performed under chloroform narcosis, owing to the extreme nervousness and struggling of the patient. Complete recovery.

CASE 2.—Woman, thirty-eight years of age. Otitis externa crouposa acuta (both), on October 25, 1889, resulted in almost complete deafness. Disease in the two ears differs. On left side membrane removed daily for six days, later less frequently; on right side membrane remained lodged for twenty-two days. Constant severe pain often deprived patient of sleep; great deal of buzzing in ears; hearing-power poor. On the twenty-third day both ears give whistling sound, characteristic of perforation; suppuration. Not until a month after the beginning of the disease, canals free from membrane; otorrhœa and pain continue till

about the fortieth day, then otorrhœa ceases. Left side: drum-membrane intact, and only intensely reddened; middle ear free. On right side, dry perforation sound. Lumen of both canals now seen to be narrowed by hyperostosis. Under these unfavorable conditions otitis externa crouposa had developed and run an especially protracted and severe course. The inflammation had caused a secondary perforation of the membr. tymp., and an affection of the middle ear in the form of an ordinary inflammation, and finally resulted in recovery, after which the lumen of the auditory canals were but half the normal size; hammer and parts of the membr. tymp. faintly visible. Hearing-power: whisper R, 4 *m*; L, 6 *m*. This, the patient stated, had been her normal hearing-power before. The anamnesis of the case revealed the fact that the patient never had cerumen, but that she almost always had been suffering from itching in the auditory canal—that is, from chronic dermatitis.

Case 3.—Man, thirty years old, presents himself January 20, 1890, after having, for six days, suffered most excruciating pain in the right ear. Otitis externa crouposa dextr. Syringing dislodges the membrane in toto. The following day a thin membrane was removed, after which a furuncle developed. Finally complete recovery.

Case 4.—December 31, 1890. Patient, a woman twenty-five years of age; for two weeks pain and buzzing in right ear. She attributes the cause to a strong draught of wind. Right ear: large fibrinous exudation; the false membrane, after its removal, shows a distinct imprint of the membrana tympani; two days later (January 2, 1891), another membrane removed in toto. Left ear: acute catarrhal otitis media, which soon subsides without any perforation of the membr. tymp. No further formation of membrane in right ear. The intense reddening of the ear-canal and of the membr. tymp. gradually disappears. Recovery.

Case 5.—September 30, 1895. A woman, thirty-three years old, taken sick three days ago. Severe pain in left ear; the parts about the ear very sensitive, but not swollen; auditory canal filled with a white mass. By means of syringing, a large cohering exudation, filling the entire canal, is removed. The walls of the canal strongly injected and moderately swollen. Hearing-power greatly reduced; conversation voice heard at a distance of 1 *m*; thus an otitis media was also suspected; sublimate compress

(1:1000); ear canal tamponed. The following day paracentesis of membr. tymp., but no secretion; severe constant pain. The next day removal of another croupous exudation; no râles of any kind on catheterization; perforation of membr. tymp. closed; insufflation of powdered iodoform. On the fourth, fifth, sixth, and eighth day, each time a freshly formed croupous exudation removed by means of syringing; sublimate dressing again applied on account of constant severe pain. After this gradual subsidence of pain and steady decrease in amount of exudation, which at last, on the fifteenth day, ceased. Hearing-power remained poor; conversation voice heard at the distance of $1\frac{1}{2}$ *m*. Very likely the patient formerly had reduced hearing-power. Recovery.

This case, also No. 2, above all, corroborate the occurrence in otitis externa crouposa of that characteristic pain, which has been described by Bezold as "most excruciating." My cases are analogous to those of Bezold in every other respect. Only the abnormal narrowing of the lumen of the auditory canal in case No. 2, due to hyperostosis, caused an unusually insidious course of the disease. In regard to the treatment, powdered iodoform, sublimate dressing, respectively at times, appear to me to be the best remedies. Histological and bacteriological examinations of my cases were not made.

ERRATUM.

The three illustrations for Dr. Preysing's article on page 127 should read

Plates V.–VII. of Vol. XXXVII.

TOPOGRAPHIC ANATOMY AND OPERATIVE TECHNIQUE OF OTITIC ABSCESS OF THE TEMPORAL LOBE.

By Dr. H. PREYSING, Leipzig.

Translated and Abridged by Dr. O. Joachim, New Orleans.

(With three illustrations on Plates V.-VII. of Vol. XXVII. of Germ. Ed.)

THREE additional cases of abscess of the temporal lobe, which I was able to examine at autopsy since the date of my first publication (*Zeitschrift f. Ohrenhlk.*, vol. xxxv., p. 108; these Archives, vol. xxx., p. 25), lead me to confirm the correctness of the course of operation previously advocated: "Do a radical operation first, then proceed through the tegmen directly upward."

Case 1. (Plate V., Outline ii.)—An abscess of the right temporal lobe was opened after radical operation; leptomeningitis and death followed.

Autopsy of the Cranium.—A large funnel-shaped wound behind the right ear, embracing the entire mastoid process and the lower part of the squama, leads to the tympanum, and the floor of the middle and posterior cranial cavities. The sigmoidal sinus down to the jugular bulb, the tegmen of the antrum and tympanum, and a small part of the brain under the squamous portion are exposed. The sigmoid sinus is not thrombosed and is covered with recent granulations; a perforation of the dura of the middle cerebral fossa exists externally to the tegmen tympani and communicates with a cavity in the right temporal lobe of the size of a pigeon's egg, which still contains pus and dirty granular masses, and is lined with tough walls. The cerebral convolutions are flat-

tened and the pia of the convex surface of the right hemisphere is hyperæmic ; at the base it is infiltrated with pus ; the dura shows on its inner surface ecchymotic spots. The substance of the brain about the abscess is cloudy, soft, and discolored.

CASE 2 (Plate V., Outline iii.).—An abscess of the right temporal lobe was incised after a radical operation. The tenaceous contents did not escape, but ruptured into the lower horn of the lateral ventricle and caused death by purulent leptomeningitis.

Autopsy of the Cranium.—The wound in the right temporal bone embraces the region of the mastoid, tympanum, and antrum, and extends into the middle and posterior cranial fossæ. The dura appears normal, except for an area as large as a pinhead between the roof of the antrum and the edge of the pyramid, just back of the right superior semicircular canal, where it is discolored a dirty reddish-brown. A horizontal section of the brain discloses a large abscess in the right temporal lobe, with dirty granular contents. The walls are firm and are surrounded by softened and discolored cerebral substance. The right lateral ventricle is distended with thick green pus, displacing the ventricular septum. A large opening establishes communication between the abscess and the inferior horn of the ventricle. The brain substance between the abscess cavity and the squama is fully 1 *cm* thick, but between the cavity and the tegmen it measures only $\frac{1}{2}$ *mm*. On the lower-outer portion of the abscess a hemorrhagic area indicates the line of incision made at operation. The pia of the convexity is extremely congested. A large circumscribed pus focus is situated between the upper surface of the cerebellum and the tentorium and extends along the sigmoid sinus and the auditory nerve. The sinus is not thrombosed and is of normal appearance, excepting a sanguineous discoloration on the surface exposed by the operation.

TECHNIQUE OF THE AUTOPSY.

The aural surgeon at the post-mortem examination of a brain must determine the presence, the origin, and extent of a leptomeningitis or of an abscess. The first part of the question may be solved by any one of the usual autopsy methods. On the other hand, the usual method, *i. e.*, Virchow's, where, after separating the cerebral hemispheres,

the lateral ventricles are opened and the hemispheres divided in sagittal sections like the leaves of a book, is really most unsuitable for our purposes. An insight into the topography of a brain abscess, its relation to important parts of the brain and to certain parts of the temporal bone, is only furnished by a few large sections.

Three sections of the brain are necessary:

1st. A horizontal section through both hemispheres, which permits the recognition of displacements by inflammatory œdema of the diseased hemisphere, its influence on the internal capsule, and variations in the kind and quantity of the contents of the lateral ventricle.

2d. A sagittal section through the diseased hemisphere to demonstrate the relation of the abscess to the Sylvian fissure, its extent in the temporal lobe, especially in disease of the left side, associated with disturbances of speech, and the point of communication with the tegmen of the tympanum or antrum.

3d. A frontal section to show the relation to the lateral ventricle and mastoid antrum.

In making the horizontal section (see these ARCHIVES, vol. xxx., p. 26), the calvarium may be removed as the dura holds the upper part of the cerebrum sufficiently together. The sagittal and frontal sections necessitate the removal of the brain *in toto* and a previous fixation and hardening. During the hardening process the lateral parts of the brain should be well supported or the entire brain should be suspended in a cloth. The sagittal section should be made between the external and middle third of the affected hemisphere, and the frontal section on a line just posterior to the base of the pons.

The horizontal section in the three cases showed that the thickness of the brain substance contiguous to the squamous portion was in no case less than 1 *cm* at the thinnest point, and not more than $\frac{1}{2}$ *mm* over the tegmen. The displacement of the median line and the distension of the lateral ventricle varied according to the size of the abscess and the amount of œdema.

The outlines of the three additional abscesses are shown

in the sagittal section, on Plate V., Figure 1, as they occurred on the same and the right side. The thinnest part of the abscess wall was in every case directly over the tympanum and mastoid antrum. The resistance of the cortex to the disorganizing process, excepting at the point of communication, was noted in all cases.

The frontal section (Plate VI.) is made through the mastoid antrum and represents a combination of Case 2 (perforation through the tegmen antri), and Case 3 (perforation into the lower horn of the lateral ventricle).

TECHNIQUE OF THE OPERATION.

The proximity of the otitic brain abscess to the primary purulent focus has established the adoption of the method of opening the mastoid previous to the exploration of the temporal lobe. Bone disease productive of brain abscess extends almost invariably to the tegmen of the antrum or tympanum, a region which is fully exposed in every operation. Precise rules for making an exploratory puncture do not exist. Hansberg[1] recommended, in the absence of a fistulous opening through the dura into the brain, the trephining over the squamous portion of the temporal bone, and one or more punctures with a hollow needle inwardly not deeper than 3 *cm* to avoid injury to the lateral ventricle. Macewen's method of exploration from the same point, in the direction forward, inward, and downward, finds perhaps more followers among aural surgeons. As many operators have only succeeded in finding the abscess after repeated attempts, the question of a more certain method suggests itself. An incision in the region directly over the tegmen of the tympanum or antrum affords, on account of the proximity of the abscess, a much better prospect of finding even a small accumulation than a lateral incision. As it is impossible to make a perpendicularly upward incision with a straight scalpel, a lancet with a shaft bent at a right angle should be used. I have had such a knife made. The blade is lance-shaped, sharp on the sides and point, and about 3 *cm* long. The shaft, which it joins at a right angle, is fastened to a handle with a screw,

[1] *Arch. f. Ohrenhlk.*, vol. xxv., 1894, p. 19.

to permit the removal of the knife for sharpening. The screw also indicates the direction of the knife.

The dura should be laid bare as freely as possible over the antrum and tympanum and a crosswise incision be made, thus lessening the danger of an infection of the subarachnoidal space.

In introducing the knife the handle should at first be elevated with the blade resting against the median wall of the antrum, and while lowering the handle to a right angle with the sagittal plane of the head, the blade is gently inserted upward into the brain substance to its bend. If done in this manner, injury to the lateral ventricle is practically impossible. With the knife in this position, and the bend resting against the inner wall of the antrum, a rotary motion of 45° should be made until the knife strikes the tegmen tympani. Gentle traction causes the wound to gap.

The knife should be removed by exact reversal of the above procedure. Besides severing the vessels of the pia mater, avoiding injury to the lateral ventricle is of greatest importance. This danger is less in this than in any other method of puncture, as the knife acts in a plane external to the ventricle.

Plate VII. ($\frac{9}{10}$ natural size) reproduces the floor of the left middle fossa with communicating openings into the antrum, tympanum, and superior semicircular canal. The line $V\ V_1$ gives the most external point of the lower horn of the lateral ventricle. (Compare Plate VI.) It demonstrates that by correct introduction of the knife an injury to the lateral ventricle is very unlikely in the healthy brain, and the inward and upward displacement which an abscess always produces renders this contingency even less probable. Functionally important areas are also exempt from injury by this method.

This procedure is recommended for trial without making claim for any new definite method of operation. Should pus be found, further procedures are governed by the necessities of the individual case.

THE OTOLOGICAL SOCIETY OF THE UNITED KINGDOM, MEETING DECEMBER 3, 1900.

Sir W. B. DALBY, President, in the chair.

A case of deafness, perversion of taste, and facial paralysis associated with herpes. Shown by Mr. A. H. CHEATLE.

The patient, an unmarried woman aged twenty-seven, had never suffered from her ear until the present attack. No definite history of syphilis could be elicited, but she had pigmented scars upon both legs and a smooth ulcer the size of a threepenny piece on the calf of the left leg. A fortnight before being seen at hospital she noticed some "blisters" on the right of the middle line of her neck, below the chin and above the sternum. Several other such spots appeared in lines running to the back of the neck, as well as an isolated one immediately in front of the lobule of the ear. Shortly after the appearance of these spots severe neuralgic pains were experienced in the back of the neck and behind the ear, together with a roaring noise and deafness in the right ear. Right facial paralysis was also present. A week after the facial paralysis appeared she had an attack of vertigo lasting two days, accompanied by vomiting. Her sense of taste also became perverted. On examination there was right facial paralysis; the right membrane was slightly retracted. She was placed on iodide and counter-irritation was used behind the ear.

Mr. Cheatle desired to know whether any of the members present had met with a similar case, as he considered the symptoms associated with this particular case very uncommon.

Discussion.—Dr. MILLIGAN asked whether the patient had had any previous attack of Russian influenza. He considered the case to be one of peripheral neuritis, probably post-influenzal. Mr. BALLANCE agreed with this expression of opinion. Mr. CHEATLE replied that the patient had not had influenza lately, but

she was exposed to cold a few weeks before the present symptoms came on.

Notes of a case of bilateral auditory nerve paralysis in a case of intracranial tumor. By Mr. C. H. FAGGE.

The patient, a female aged nineteen, was admitted into Guy's Hospital, under the care of Dr. Hale White, in October, 1900, complaining of vomiting and dizziness. The patient's mother had suffered from ear disease. Several years ago the patient began to get deaf upon the left side and to suffer from noises in the ear and from giddiness. Shortly afterwards she became gradually deaf in the right ear; her eyes also began to trouble her, the left becoming blind, and shortly afterwards the right also. On admission, she was found to be blind in both eyes and deaf in both ears, and complained also of noises in the head and dizziness; no paralysis of motion, but a tendency to fall slightly to the left side when walking; no alteration of sensation; frontal and occipital headache; reflexes normal; mental faculties good; speech normal.

Discussion.—Mr. CHEATLE asked about the characteristics of the vertigo—was it true auditory vertigo? He hoped that if the patient died Mr. Fagge would secure a section of the labyrinth of both sides and a full post-mortem report. Dr. MILLIGAN asked whether puncture of the lumbar theca had been performed and the fluid analyzed. He did not think the symptoms warranted the diagnosis of tumor but of basic meningitis, which was slowly increasing and which was possibly of syphilitic origin. Mr. FAGGE in reply said that the patient was so deaf and ill that he was unable to make her understand anything, but she volunteered the statement that things went round her. In answer to Dr. Milligan he said that no lumbar puncture had been performed.

A case of double ossiculectomy for chronic middle-ear suppuration. Shown by Mr. LAKE.

The patient, a female aged thirty-three, had had scarlet fever when two years of age, with subsequent discharge from both ears. She was married at the age of fifteen; has had pneumonia, nephritis, and undoubted specific disease. The discharge from her ears has been practically continuous ever since. When examined, the right membrane was found destroyed, with the exception of a small outer rim. The left was perforated in its lower part and had a second perforation leading up to the antrum.

Local treatment was adopted for three months, but as pain, giddiness, and discharge were still complained of, the ossicles, the remains of the membrane, and the outer attic wall were removed under ether narcosis. Healing took place upon the right side in four weeks and shortly afterwards upon the left side.

Discussion.—Mr. CHEATLE asked how long the discharge had lasted and what was the cause. The PRESIDENT said the middle ears of the patient seemed very dry and satisfactory. He thought that one could not well foretell what the condition of the hearing would be after removal of the ossicles. Mr. HILL asked whether Mr. Lake had only practised ossiculectomy or whether he curetted the attic afterwards. Also whether Mr. Lake removed the outer attic wall under a general anæsthetic.

Dr. BRONNER asked whether insufflations of iodoform had been used six or seven times a day.

Mr. FAGGE asked whether Mr. Lake operated under a local anæsthetic.

Dr. MILLIGAN asked whether any preliminary antiseptic treatment had been adopted.

Mr. BULL said that the case could not be regarded as a true case of ossiculectomy, as Mr. Lake had burred away the outer wall of the attic.

Mr. CHEATLE said that they had come to the conclusion that the outer attic wall should be removed when ossiculectomy was performed.

Mr. LAKE in reply said that the discharge had lasted thirty years and that the original cause was scarlet fever. In performing ossiculectomy he always removed the outer attic wall and cleared out everything he could. He thought local anæsthesia insufficient in such cases. Previous antiseptic treatment had been employed for three months before any operation was attempted.

Patient upon whom the complete mastoid operation had been performed; subsequent epithelial grafting. Shown by Mr. HERBERT TILLEY.

In discussing this case Mr. BALLANCE said that Dr. Tilley had completed the operation by means of small epithelial grafts instead of opening up the wound again under a general anæsthetic.

He (Mr. Ballance) did not think that the question of giving the patient an anæsthetic a second time should enter into the decision. As Mr. Tracy had already mentioned, the appearance was not just as the pith of the communication indicated. There

was a crescentic perforation in that portion of membrane which stretched across the deeper part of the meatus. This membrane was in the position of the membrana tympani, so that the scar-tissue membrane had grown up with a large perforation in its centre, through which pus was oozing. He did not think that the tympanum, the attic, or possibly a portion of the antrum had taken the graft. Probably the fault was not Dr. Tilley's, as the patient had gone away before the completion of the treatment. He thought that Dr. Tilley had not removed all the soft parts at the first operation. In performing the radical operation he advised complete clearing away of all the soft tissue.

In reply to Mr. Ballance's remarks Dr. TILLEY said that it was two and a half months since he had seen the patient. He (Dr. Tilley) applied several grafts. The patient insisted on returning to business before complete healing had taken place. He was sure that at the first operation all soft parts were completely cleared away. He brought forward the case as he considered it illustrated an alternative plan of dealing with the grafting process.

Mr. BALLANCE said that in cases where grafting was adopted the personal attention of the surgeon was necessary in order to secure a good result.

Notes of a case of primary sarcoma of the base of the skull in the position of the Eustachian tube. By Mr. ABBOTT.

New portable motor for surgical purposes. Demonstrated by Mr. BALLANCE and Dr. MILLIGAN.

The apparatus was specially designed for operations about the mastoid region. The motor was made so that it would stand firmly upon an ordinary table. It was about 1/12 of a horse power in strength and ran quietly and steadily. The speed could be regulated by a foot arrangement. The bur was attached to a flexible steel arm which enabled it to be used at a considerable distance from the motor. The hand piece was detachable and simple in construction. It could be taken off and sterilized.

THE NEW YORK OTOLOGICAL SOCIETY. REPORT OF THE MEETING OF JAN. 22, 1901.

By Dr. H. A. ALDERTON, Secretary.

VICE-PRESIDENT, DR. J. B. EMERSON, IN THE CHAIR.

Dr. Whiting presented a **case of sinus thrombosis,** reported from last meeting (boy from Norwich). Wound practically entirely healed. The patient was in good health and had gained in weight. The patient has perfect control of the jaw, notwithstanding the entire removal of the glenoid fossa and attachments of the inferior maxilla. Dr. Whiting reiterated his belief in the advantage of the use of the encephaloscope, to the aid of which he thinks the boy owes his life. The jugular was not tied, as it would have jeopardized the patient's life through the prolongation of the time of operation. Does not know whether there will be any regeneration of bone, but thinks it possible.

Discussion.—Dr. Berens asked what was done with the dura and how Dr. Whiting overcame the hernia. Dr. Whiting: The hernia was very small. It partly retracted and partly became cicatricial. The dura cicatrized together. The aphasia has absolutely disappeared. Dr. J. L. Adams asked how the abscess healed up. Dr. Whiting: The walls came together and united. Dr. Marple asked whether there are any mental phenomena at present. Dr. Whiting: None, so far as he has been able to detect. Dr. Dench has a case with emotional characteristics, a case of temporo-sphenoidal abscess. Thinks a hernia cerebri is always an evidence of tension; when the abscess is thoroughly evacuated there is no hernia. In hernia there is probably always an abscess. Dr. Whiting has seen five cases of brain abscess; in all there was hernia. He thinks they were all thoroughly evacuated. Dr. Dench asked whether this was not simply

necrotic tissue pushed out. Dr. WHITING: There was brain substance as well. Dr. EMERSON asked whether he would give the patient any mechanical protection. Dr. WHITING: A good idea; he should think of it. Dr. MCKERNON: A general surgeon in such a case had employed a rubber plate held in place by a band around the head.

Dr. BERENS **presented two specimens** prepared by Dr. E. S. Thompson, Pathologist of the Manhattan Eye and Ear Hospital. First: A specimen of a temporal bone with an anomalous facial nerve. The course across the upper part of the tympanum, the aqueductus Fallopii, was unusually prominent. Above the middle of the tympanic part was a foramen communicating with the superior semicircular canal. The facial nerve instead of bending down and slightly forward to its exit at the stylo-mastoid foramen, bent slightly down after leaving the tympanum and then forward at an angle of 45°, running almost parallel with the auditory canal. When nearly at the surface of the bone it bent down and made its exit from the stylo-mastoid foramen three or four millimetres more external than the foramen usually lies. In opening the mastoid cells it would have been almost impossible to avoid wounding the facial nerve. The other specimen was an infantile temporal bone showing the tympanum rather lower down than is usual and lying next the mastoid.

Discussion.—Dr. DENCH has noticed the same distribution of the cells as in first specimen while operating; and also the extension of the cells far into other regions. He thinks the tendency has been to confine our operation field to too small an area.

Dr. WHITING **presented set of mastoid gouges and chisels** of new pattern, with large handles.

Discussion.—Dr. FRIDENBERG has felt the need of just such instruments, especially in the Stacke operation. Dr. DENCH asked whether the large handle does not obscure the field of operation. Likes the length. Thinks the chisel is ground at a much better angle than the usual one. Dr. WHITING did not find any trouble from the large handle. Dr. A. H. KNAPP stated that Ballance uses a large and long chisel.

Dr. TOEPLITZ **presented a new lingual and a new faucial tonsillotome.**

Discussion.—Dr. FRIDENBERG asked whether the fork could be taken off and cleaned. Dr. TOEPLITZ: Very easily. Dr. QUINLAN thought the blades were not strong enough. Thinks the

simplest instrument is the most perfect. Dr. TOEPLITZ did not find this objection to hold in actual use. The great advantage is that you do not have to use any pressure whatever.

Dr. WILSON reported a **case of tumor of the external auditory canal** in a young man, twenty-eight years old. In the right ear: it was purplish, hard, and nodulated. Measured 9 x 5 *mm*, on the posterior wall. Burned with nitric acid. Apparently eradicated. There was a recurrence. Reported epithelioma, on examination. Base had enlarged to 11 x 12 *mm*, but the principal extension had been inward and upward. No pain, no ulceration, no glandular enlargement. Dr. Wilson wished to know, if operation was thought advisable, how much tissue he would be justified in sacrificing.

Discussion.—Dr. DENCH: All that is diseased, he should think. The growth is very happily located for removal. Dr. WHITING: Was there suppuration? Dr. WILSON: No. Tympanum intact. Dr. A. H. KNAPP: Is the bone involved? Dr. WILSON: No. Dr. WHITING reported cases of epithelioma of the middle ear. No appearances to lead to a suspicion of malignancy, except enlargement of parotid gland. Radical operation. There was chronic suppuration of middle ear and mastoid process. Healed quickly. Pathologist reported case of epithelioma. Recurred. In two other cases, termination same. Advises non-interference. Dr. KIP thought these were cases of carcinoma. All such cases are, in his experience. Dr. WHITING: Pathologist so reported. Dr. KIPP advises against operation. Dr. DENCH advised operation because he thought it was a case of fibro-sarcoma. In such cases a complete recovery may be brought about. In malignant (carcinomatous) growth of the outer ear, he has had one case that has not recurred in eight years. He has had other cases. If the tympanum is not involved, he should advise operation. Dr. TOEPLITZ reported a fatal case of carcinoma of the middle ear, involving the entire petrous bone. Dr. WILSON asked whether any of the gentlemen had had any experience of entire removal of the soft parts of the external ear. Dr. WHITING: Yes; tied common carotid before operation very luckily, even then the bleeding was tremendous. Dr. BERENS believes in giving the patient a chance. Dr. EMERSON spoke in favor of operation.

Dr. J. L. ADAMS spoke of the **sinking of the posterior, superior wall of the osseous canal.** Asked whether this symptom alone is sufficient to indicate operation in middle-ear suppuration.

Dr. DENCH thought tenderness on deep pressure close to the auricle is usually present in these cases. Dr. ADAMS: There was no tenderness in these cases. Dr. GRUENING: Sometimes you don't get tenderness, even sometimes when there is crepitancy due to thinness of cortex and distension. Dr. TOEPLITZ remembers one case, sudden cessation of suppuration with bulging as above. Incised swelling, and symptoms subsided. Dr. ADAMS: Always does this. Dr. QUINLAN reported case relieved by such incision. Dr. MCKERNON: Any occlusion of cartilaginous canal, etc., or tenderness on traction? Dr. ADAMS: Yes. Dr. MCKERNON thought it a case of external otitis. Dr. ALDERTON spoke of a case in which this sinking of the posterior superior canal wall was a marked symptom. A remarkable point about this case was noted in that the healthy bone around the bone wound, after operation, became the color of skimmed milk—a bluish white—for quite an area afterwards. The patient was not anæmic; was a strong, healthy young woman. No sequestrum formed. Gradually the bone lost its blanched appearance and partook naturally in the healing process. Dr. WHITING: Had seen such an appearance in a very anæmic child. Case of sinus thrombosis with resection of jugular. Fatal. No reparative effort. Died of general sepsis.

Dr. BERENS has used ethyl chloride as a local anæsthetic to do a mastoid operation, with good results.

Present.—Drs. Fridenberg, Emerson, Whiting, McKernon, Toeplitz, Brandegee, A. H. Knapp, Kip, Dench, J. L. Adams, Berens, Marple, Wilson, Quinlan, Hepburn, Gruening, and Alderton.

THE SECTION ON OTOLOGY OF THE NEW YORK ACADEMY OF MEDICINE. REPORT OF THE MEETING, JANUARY, 9, 1901.

DR. R. C. MYLES, SECRETARY.

DR. J. F. MCKERNON, PRESIDENT, IN THE CHAIR.

Electrolysis in the destruction of organized strictures of the Eustachian tube. By J. A. KENEFICK, M.D. (Published in full in this issue, p. 73.)

Discussion.—Dr. WM. P. BRANDEGEE: All I can say corroborates the reader's experience. I had the pleasure of examining these cases, forty or fifty in number, with Dr. Kenefick, and while those reported are simply average cases, they are excellent examples, because the records of them have been kept very carefully.

There are several things to be said in favor of the electrical bougie. I would especially call attention to the painlessness of this method as compared with other bougies. The trauma incurred in using wire bougies is considerable. The pain to the patient is excruciating. When we compare the wire method and the electrolytic method, the latter is considerably more agreeable to the patient. The pain that follows the manipulation is very slight, at least, in my experience, only for some minutes. The patients have experienced great relief almost at once when the bougie has been successfully carried through to the middle ear, and it is astonishing that nearly all patients have declared that a wall has been removed and that some improvement set in almost immediately. This seems rather wonderful to me. I might say that we get the same result following the use of the wire or other bougies, but the easy manipulation, the painlessness of it, and the permanency of results are quite another thing. I have seen

results which were so rapid that inside of ten days after the use of this instrument the hearing for whisper was increased marvellously. The patient himself says that in no other treatment has he experienced such remarkable relief. People of the lowest classes who have travelled around the clinics have expressed this great relief in the most glowing terms. The history of these cases shows that the results are rather brilliant on account of their permanency. There is nothing more to be said as far as I am concerned, but I trust that the discussion will be very open about it.

Dr. WENDELL C. PHILLIPS: When I first began the treatment of strictures of the Eustachian tubes by the method known as electrolysis, I was more or less sceptical as to its possibilities and to the results that might be obtained from its use. My scepticism has not yet entirely passed away, at the same time I have seen results in a few instances that certainly have been striking. About a year ago we placed in the ear clinic of the Manhattan Eye and Ear Hospital a complete outfit for doing this work. The patients at my clinic at the Post-Graduate Medical School and Hospital are also having the benefit of this form of treatment. Dr. Harris is giving his full attention to the treatment of these cases. We are keeping very careful records and at the proper time our results will be made known. So far, we are not studying results, but are giving most careful attention to treatment and records. I believe the apparatus we are using is an improvement over any formerly used. The Messrs. Wappler Bros., who have constructed this apparatus, seem to have filled all the requirements, and it, apparently, perfectly controls the current. I very soon found that one could vary the strength of the current by making more or less pressure of the hand electrode, and have had an electrode constructed that slipped over the wrist and gives equal pressure all the time. This is certainly a distinctive action in the method of the work. We also use a low voltage, rarely using more than fifteen or sixteen volts of the current. With this voltage I cannot see how any harm can be done to the tissues when intelligently used. The mere fact that you add a perfectly controlled current of electricity to the presence of a gold bougie should have no damaging effect upon the tissues. Some precautions are necessary in using the street current, as it is possible to make short circuits through gas fixtures or Croton-water pipes. The patient should be instructed not to touch these while the

current is being used, or, on the other hand, these near-by fixtures should be insulated. I believe the apparatus constructed for our clinic is now coming into general use.

Dr. W. K. Simpson: I have used electrolysis a great deal, —almost daily in my practice—and although my results as to the increase in hearing have not been as brilliant as have been reported here to-night, I can say, however, that I think it is the only method we have by which we can overcome strictures in the Eustachian tube. I think that the introduction of this line of treatment has revolutionized the whole subject of stricture of the Eustachian tube. In my experience we cannot always tell by the character of the sound we get through the diagnostic tube whether we have a stricture or not. I have repeatedly experienced what has seemed to my ear to be a most perfect sound, as if the air went thoroughly into the tympanic cavity. It has been a surprise to me at times, after getting a very full sound through inflation, to find, in passing a bougie, a stricture very near the proximal end of the tube. So I think in that respect the only real positive means we have of diagnosing stricture is by passing the bougie. My experience has been that the majority of the strictures occur about one inch within. I always attempt to pass the Eustachian catheter with the aid of the rhinoscopic mirror, having the patient press the tongue, and passing the catheter through the nose; we can then see the end of the Eustachian catheter pass in the Eustachian tube. By that means we know absolutely where we are. We all know that we can inflate the Eustachian tube without the catheter being exactly in the orifice, but if we see the catheter enter by means of the mirror we know where it is and we gain a considerable distance. We can gain frequently as much as $\frac{1}{8}$ to $\frac{1}{4}$ of an inch, and I think that this is a very valuable point to consider. In electrolysis I am accustomed to use the hard-rubber catheter, which is entirely insulated.

Recurrence of stricture, I think, happens quite frequently. That has been my experience, and I think it a good plan, after electrolysis, to pass an ordinary Eustachian bougie in order to keep up the dilatation.

In relation to the sequelæ I have never seen any trouble except once where middle-ear disease followed electrolysis. Exactly why it happened I do not know, as all the laws of asepsis were observed.

I did not hear the beginning of this paper, and ask if the speaker will mention just the size of the tube he uses. In that regard I may be at fault in not getting a permanent result. I generally use a small size and dilate subsequently. In two instances I passed the second size into the Eustachian tube as far as I could and was unable to get it out. I was in quite a predicament to know what to do. I tried electrolysis but it did not answer, and simply got it out by the use of strong traction force. In conclusion I can only say that I think Eustachian electrolysis has opened up a broad and new field in the subject of Eustachian stricture and we are sure to eliminate one great cause in middle-ear deafness.

Dr. T. P. BERENS: I should like to congratulate Dr. Duel upon one of the greatest advances in the treatment of deafness associated with Eustachian disease, and to congratulate the reader on his success with this method.

In regard to instrumentation I have from the first adopted the hard-rubber catheter. It is easily disinfected. It is easily bent by the use of heat, and the objection that has been raised to it, namely, that of warming under the current, I have not yet noticed.

Dr. Simpson called attention to a certain class of cases that I have met with quite frequently, namely, those in which we appear to get a complete inflation by the use of the diagnostic tube so far as our own hearing goes. In many of these cases inspection reveals that the membrana tympani is in exactly the same position when we use the catheter.

In regard to recurrence of stricture after dilatation, it has been my misfortune to have a recurrence, although it was longer delayed than after the use of the old-fashioned bougie. I mean by that from two or three to five or six months.

With regard to the difference in pain I must disagree decidedly with Dr. Brandegee. The old-fashioned bougie used with the same caution and slowness in my experience has not caused more pain than electrolysis. If the stricture is very tight, the old-fashioned bougie will cause, under the most gentle pressure, about the same amount of pain as the current. It is not my habit to use more than five milliampères. I find this thoroughly sufficient.

Dr. ROBERT NEWMAN: Electro-therapeutics should be more taught by our colleges and used by the profession, and there is not the slightest doubt in my mind that strictures of any kind, and

particularly of the Eustachian tube, can be cured by electrolysis. Permit me to show you the instrument which I have had constructed for this purpose. The catheter is introduced into the Eustachian tube with great care, till the stricture arrests its progress. When it is attached to the negative pole of the galvanic battery, the patient takes in his hand as a positive pole a moistened pad or handle. The current is very slowly increased from zero, according to the toleration of the patient, but, as a rule, should not be stronger than five milliampères. The operator very gently guides the inner tube as the electrode and pushes it forward only when the electrolytic current has absorbed the obstructions. Too much in one séance must never be done. Undue force must never be used; the electrolysis must do the work of absorption. The milliampère meter is a necessity. The current must be steady, slowly increased, and before removal of the catheter slowly decreased to zero. The catheter fully introduced is not longer than any of the usual Eustachian catheters.

Now treatment and cure by electrolysis is entirely a chemical action of the electric current and nothing else, whereby the pathological tissues are absorbed. I must decidedly object to the names and action of electrolysis which have been used and stated in literature and also by some speakers here to-night. Electrolysis is *no dilatation.* Dilatation is a certain kind of pressure or force. As soon as you use pressure with electrolysis you prevent the action of electrolysis. You push the instrument through the stricture by force. The instrument must be gently handled and guided as most aurists do, and there we have only the electric chemical action by absorption, and the negative electrode will pass forward, through the stricture. There is *no* cauterization. Some confound galvanic cauterization and electrolysis. Electrolysis is only an absorption. The effect of electrolysis depends entirely on the strength of the current used. A weak current never cauterizes. A strong current cauterizes and may destroy tissues. If many gentlemen, particularly some of my friends in the country, use thirty to forty milliampères they certainly must destroy tissue. I never use more than five milliampères either in the stricture of the urethra or in the ear. Sometimes two milliampères will do. The voltage does not make any difference, as it is nothing but the pressure with which electricity comes from the galvanic battery. The strength to be used must be regulated by milliampères; two and a half milliampères

may be sufficient according to the effect produced and the sensation of the patient. I have seldom used more than four, never more than five milliampères. Therefore there is no dilatation, no cauterization ; it is a chemical absorption by electrolysis.

Then some of my friends say it burns. The current used is lower than the natural heat of the body and such a temperature cannot burn ; if the operator burns, it is malpractice !

About the pain. The electric current necessary cannot cause any pain, but it may be induced by passing the electrode with force or over denuded surfaces. By the electrolytic action and by handling gently, as you all do, *no* pain is caused.

Of course we must take the negative pole to the stricture. We must use the battery having little cells, small surface of elements, and we do best to have our own apparatus, our own galvanic battery. If we cannot use the battery according to our own ideas, the next best is the Leclanche cells, enabling us to regulate the current by single cells. The current from the street is not reliable. It does not give the fine electric action; besides we do not know what may happen at the power house, where the engineer changes the current to suit his wants. We have the current not in our hands and the patient may get a shock, which is very dangerous to anyone with deafness.

The current must be weak and not continued too long. At best I would not continue it longer than five minutes. Next the external resistance must be regulated. One speaker said he uses the electric catheter in the Eustachian tube and puts the positive pole on the ear externally. I consider that a mistake. If the electricity travels a long distance in the body we can give more current and apply this to the body of the patient. Electricity travels by the shortest road, which concentrates the strength, and too near to the origin of cerebral nerves, causes disturbances to the brain and nerve of sensation, like flashes to the eyes, shocks, metallic taste, etc. Therefore I place the positive pole in the hand of the patient and only then inverse the electric current from zero, cell by cell, until I have the desired amount. These applications must not be given too frequently; no interference must be allowed between operations. Five to six days or a week I consider a good interval. In one particular instance when I had used electrolysis in a stricture of the urethra, I know that a doctor played a trick on me, by using instruments in the urethra after my application, which destroyed the electrolytic action and prevented a success.

Now about relapses: I have treated about two thousand cases of stricture of the urethra and have never yet found on examination any relapse. If the stricture is treated well, with care, and cured, I have never seen a patient come back with a stricture in the same place. But if there is a cauterization or interference, of course there will be a cicatrization. A scar will never be made by electrolysis when correctly applied, and electrolysis will not injure the mucous lining.

There are certainly many cases on record where strictures of the urethra and other strictures have been treated with bad results. But such results are the fault of either the operator's undue pressure, bad instruments, or incorrect batteries. If you use the right instruments, gently handling the same, so that electricity only works, and not pressure, there will be no trouble. That is one of the reasons why I object to calling the action a *dilatation.* If the operation is done correctly there is No dilatation, No cauterization. No burning, No pain, No relapse—(at least in the urethra)—but the stricture is cured by an enlargement of the calibre through the chemical absorption of the pathological tissues by electrolysis of the galvanic (constant) current of the negative pole—which latter electrode must be a metal which is not itself decomposed by the electrolysis.

They may come back with another disease of the bladder, prostate, urethra, etc., but I have never seen a relapse of urethral strictures if electrolysis was properly applied.

Dr. A. B. DUEL : It has been very gratifying to me to hear this paper and all this discussion on a subject which is so interesting to me, and for which, in a way, I may be said to be responsible. Not that I wish to claim priority in the use of electrolysis in the Eustachian canals, but it has been due to the perfection of the technique and to the insistance on my part on the usefulness of this procedure in the relief of stricture of the Eustachian canal that so many otologists have made use of it.

As to the instrument which Dr. Newman has shown, one has simply to look at the size of it to understand that it could be pushed only a short distance into the mouth of the Eustachian tube, and that it could not possibly be passed even as far as the isthmus. Many strictures occur before this is reached, and I have no doubt that many such cases which have come under Dr. Newman's care have found a great deal of benefit from the instrument he uses.

Stevenson, of London, in his history of eight cases, covering a period of two or three months, reports some success in treatment and speaks of having used a bougie which was protruded from the end of the catheter about one inch.

I must give all credit to Dr. Newman for suggesting the use of electrolysis to me, because the fact that I had had repeated success in using it in strictures of the urethra, as detailed by him, led me to think of using it in the Eustachian canal, and with a better knowledge of the length of the Eustachian canal, and the size of, it I constructed my bougies I have insisted that the bougie in all cases should be passed into the tympanum. Those who have used it very much have seen that there are often strictures at the isthmus and beyond it which could not be reached by this instrument of Dr. Newman, or that of Stevenson. I believe it is entirely due to this technique that I and many others have been enabled to report so many successful cases.

To those of us who have made use of the catheter intelligently for several years, electrolysis of the Eustachian tube for the relief of stricture is a thing which has come to stay, and we all feel in our own mind that it is a useful procedure which can not be dropped; that it is to the relief of stricture of the Eustachian canal what the improvement by the introduction of the catheter in its inflation was to the Politzer method of inflation.

In regard to the technique, several gentlemen have made use of, and try to justify their position in using, the rubber catheter for the purpose of insulation. I have tried it and have given it up, preferring the pure silver catheter, which can be so much more effectually sterilized by boiling, more easily bent to fit accurately in the mouth of the Eustachian tube, and easily insulated by the rubber tissue wound about it in the manner exhibited in the catheter which is being passed around.

In regard to the use of the bougie which has been insulated up to the bulb, I have never thought it necessary to use it.

The current strength which is indicated on the milliampèremeter always is the current strength which comes from the point of closest contact with the tissues, because that is the point of least resistance to the current. This, naturally, is at the point of the stricture where the bulbous head of the bougie comes in contact with it. Of course the current in lesser strength comes from every point of contact with the other portions of the tube, but as it is quite probable that the whole mucous lining of the Eustachian

canal is somewhat thickened, I have always thought that it was more than likely that mild electric action, which was obtained by the contact of the wire with the portion of the tube, was a useful one.

In regard to the time of application of electricity, I agree perfectly with Dr. Newman, never using a contact for more than five minutes nor a current strength of more than five *m. a.*

In regard to voltage, I feel certain that the use of a high voltage to obtain a certain current strength causes more pain to the patient than would be caused by obtaining the same amount of current with a low voltage.

In regard to recurrence of the stricture, the same causes which produced the primary stricture will naturally produce it again if treatment is not kept up. I do not think that stricture which has once been done away with by using electric action, will return, but others may return from the same causes which produced the first one. The use of electrolysis for the relief of Eustachian obstruction is not all that is necessary in the treatment of catarrhal otitis media, although the opening of the Eustachian tubes, thus ventilating the middle ear, is probably the most important thing to be done in such a condition. In cases of sclerotic form of otitis media, the chance of improvement is very slight as compared with those cases where most of the damage is in the Eustachian tube.

I wish to call your attention to one more point. The use of electricity is unfortunately one of the chief resources of many charlatans. It is liable to be looked upon by many in the medical profession as well as by intelligent members of the laity with a certain amount of suspicion. Many practitioners, either because they have not investigated the usefulness of electricity at all, or because they have not met with success after trying it for a short time without any knowledge of it, have given it up as useless. It seems to me that all otologists who make use of it ought to be very careful to explain to those who come under their care, and to members of the profession, that we are making use of it simply to accomplish a mechanical result, to effect a reabsorption of certain thickenings, and that we are not using electricity for the cure of all forms of deafness.

I may have spoken with too much confidence in this matter of electrolysis, but if I have done so it is with the confidence born of success after the successful treatment of scores of cases which

have come under my care after failure at the hands of prominent otologists all over this country.

Dr. EMIL GRUENING: I have not used electrolysis, but as you have also called upon those who have not used electrolysis in the Eustachian tube to take the floor, I want to make a few remarks. I am not convinced. I was sceptical when I came here and shall go home more sceptical than when I came. Dr. Kenefick read his paper most admirably, but in this paper are merely positive assertions but no proof. He read the cases of several patients, but there are lacking the data of the functional and physical examination of these cases before and after the electrolytic treatment. The statements made in these seven cases are too general. When such a discovery marking an epoch is proclaimed we are entitled to demand scientific proof. The remarks of Dr. Duel are also general assertions. The proof is lacking. What the profession and laity want to know are facts, and these are lacking.

Dr. A. B. DUEL: I should like to call Dr. Gruening's attention to the fact that two years ago I published a report of fifty cases from hospital and private practice which had been under my care for a considerable period. For more than a year previous to the publication I had devoted all my time and attention at the New York Eye and Ear Infirmary, to this work, and had only cases of this character sent to me. In all these fifty cases a functional examination was made before the treatment was instituted, and afterward at intervals of from one to several months. For the convenience of those who read the paper a tabulated report of these functional examinations was appended, and if Dr. Gruening cares to look that over he will find some statistics which will doubtless convince him that the claims which were made for the usefulness of the electrolytic bougie were not entirely groundless, nor based upon unscientific examinations.

Dr. W. K. SIMPSON: I would like to ask for information on one point especially. As undoubtedly all Eustachian tubes are not of the same length, how are we to know that we are in the tympanic cavity. I should like to ask the reader of the paper to answer that. It is important to know what length we are to go.

Dr. J. L. ADAMS: When I bought an outfit for electrolysis I got four bougies, and two of them were so large that I have never been able to use them in any case. The two small ones I have always used.

Dr. H. KNAPP: I know but little about the subject. I am, how-

ever, not inclined to be so negative as Dr. Gruening. While listening to the paper I thought it was very ably and nicely put. If it furnished no proofs of exact measurements of the function of the ear, it recorded, in some cases, an improvement of hearing, which struck me as very remarkable. I do not think that in a science which is forming we should exact mathematical proof. It would be better, of course, if we could get it, but if we obtain only a reasonable encouragement in the treatment of so hopeless an affection as chronic middle-ear catarrhs, we should accept it with gratitude.

Dr. EDWARD B. DENCH: I feel very much obliged that this work has been carried out in my clinic and I think that the histories have been most carefully kept. Certainly every care was taken to make the work as scientific and careful as possible. I personally have used this method comparatively little and have but a limited personal experience with this method. It seems to me that the great aim is the relief of any obstruction which may be found in the tube. I do not think it makes any material difference whether you do that by means of the electric bougie or with some other bougie, if you only get a result. I state this only as a matter of experience.

I must disagree with Dr. Brandegee in one point, that is, that the simple bougie as used formerly is always painful and the electric bougie entirely free from pain. I have heard several patients state that the electric bougie was slightly less painful, but I have never heard any complaint of very severe pain, if the simple bougie was carefully used. The particular instrument which you do use for this purpose is not of much importance. A good many years ago I used a bougie similar to the one presented by Dr. Kenefick, that is, a metal bougie, and I found that it caused considerable pain. I discarded metal bougies and used the simple method with which many of my friends are acquainted. The bougie consists of a piece of No. 5 piano wire of sufficient length to project about one and three-fourth inches beyond the end of the Eustachian catheter. The distal end of the wire is bent flat upon itself for a length of one-sixteenth of an inch, and the bent portion is wound firmly with sterile cotton. This device has proven efficacious in my hands, but it does not make much difference what instrument is used. When the electrolytic method is used, you are dealing with such a small quantity of electricity that it must be distributed all through the shank of the bougie, as Dr.

Duel says, and there must be short circuiting through the catheter, so that the action of the current must be very slight in these cases.

In regard to recurrence of obstruction in these cases I have certainly seen tubes that have not been thoroughly cleared by means of electrolysis, and in two cases I found the tubes just as much stopped after treatment as they were before. I remember at least two cases where great improvement had been supposed to follow the use of the electric bougie, and I found that the hearing was the same as after simple catheter inflation. I don't understand the amount of improvement which we get from the use of the electric bougie in tubes that are open. I must disagree with Dr. Simpson in the statement that the use of the diagnosis tube does not always give information as to the condition of the Eustachian tube.

In the cases of great improvement in hearing following the use of the electric bougie where the Eustachian tube has been perfectly patent, is it not possible that we have to do here with a simple vascular condition of the Eustachian tube? We may have a certain condition of vaso-motor paresis in the tube, and a sudden increase in the hearing following the use of the bougie might be explained by supposing that the vaso-motor tone of the vessels was restored either by mechanical stimulation due to the presence of the instrument or the action of the galvanic current.

There is always great danger of drawing a wrong deduction, even if the most careful notes are made. A few days ago a patient came to my clinic with a history of progressive impairment of hearing extending over several years. The whisper was heard seven feet upon the right side and eight feet upon the lett. Catheter inflation showed slight narrowing of the right Eustachian tube but did not greatly improve the hearing in either ear. When I next saw the patient, about a week later, the whisper was heard in the right side at a distance of twenty feet. Had the electric bougie been used the deduction drawn would certainly have been misleading.

What I have said should not detract at all from the magnificent work Dr. Duel has done. I think we all have learned something about the subject from the paper, but I do not think that it is wise to go on too rapidly. Make haste slowly. All scientific facts will be gladly accepted by every member of the Society and every member of the profession.

President Dr. JAMES F. MCKERNON: I would like to add a few words regarding this treatment in support of the gentlemen who have spoken and of the reader of the paper. One of the gentlemen mentioned the possibility of bad results. I have seen two bad results in the use of this method. One has been in my own practice, one in the practice of a gentleman outside of the city who used this treatment. In each case it caused acute otitis. In the case under my own personal observation, the accident, as far as I know, was not caused by lack of asepsis, but in all probability by the too rapid passing of the bougie through a rather tight stricture. There was contact with the drum membrane; it passed directly into the middle ear. Six hours afterwards the patient complained of no pain whatever. At the end of eight hours pain was complained of, and I saw a distinct hyperæmia over the membrane and around the tympanic orifice of the Eustachian tube. At the end of eight more hours there was serous fluid in the middle ear, which I immediately liberated.

The other case came under my observation four days after the rupture had taken place. The doctor described this case to me as a somewhat similar one. Those have been the only cases that have come under my observation where bad results have arisen in using this method. I have used this method a great deal during the last four years.

I certainly am able to get better results with this method of treatment than I was with the old method. One may become more accustomed to it by using a certain technique of the instrument. I gave the other method a trial but I did not have the same results, although I passed through into the tympanum in nearly every case. There is one point the reader of the paper might have brought out. Any physician who expects to get the apparatus should be very careful that the bougies are long enough, because certain of them are too short and such ones cannot be passed into the middle ear. In several instances gentlemen who have used this method out of town had complete failures, and when they sent me the bougies I found that none of them had passed through and gotten into the tympanum, owing to the shortness of the bougie. You may find that in one catheter the bougie is plenty long enough, but in another catheter it is not long enough to reach the middle ear.

With regard to recurrence, there are recurrences in the same patient and the same tube if not at the same place. Here we simply

have to take into consideration the fact that when we overcome the stricture it may recur at that point or it may recur at some other point, provided the catarrhal condition that caused the primary narrowing be not cured.

Regarding the amount of pain : my patients certainly have not had as much pain as they had with the old method ; it may be because I use a little more cocaine or more care, or have become accustomed to its use. I have used the new method more than the old one, and have never known the patients to complain of pain after the sitting was over.

I wish to mention just one more point which the reader did not bring out, and that is the moistening of the electrode. Dr. Duel has mentioned in his other papers that by using ammonia water the electric action seems to have a little more rapid effect than if plain water were used.

In all of those cases which have been treated by this method in my clinic by Dr. Duel, Dr. Kenefick, and myself, and in my own practice, a functional examination was made, and in every case the history has been kept. The patients have been functionally tested before and after the treatment. If you cannot call this distinct and definite from the standpoint of examination, I don't know what is so.

One should be very careful with regard to the electrical part of it, using no more than 30 to 40 volts, very rarely over 2½ milliampères, and contact anywhere from two to four minutes.

The greatest care should be employed in passing the bougie through the tube and as little force as possible employed. Whatever the action on the tissues may be, whether a simple stimulus to the circulation, and this in turn stimulating the efferent vessels to greater activity, or a distinct chemical action, the clinical fact remains that we are enabled to open the tube and benefit our patients far more than when the older method was used.

Mr. J. J. CARTY : I was much interested in the discussion. But I have been impressed with the little amount of attention that has been given to the main agent used here, which is electricity. The method of handling the bougie and the other apparatus has been discussed fully, but when it comes to the use of the agency, if I were asked to construct the apparatus I would not know how to go about it, were I to depend upon what I have heard to-night.

I heard it mentioned by one speaker that 35 volts should be used; by another, Dr. Newman, that 4 volts should be employed;

some one else is in favor of 10 volts. The current employed seems to be about 5 milliampères. These discrepancies in voltage indicate lack of precision in an important matter. I think it well to sound a note of warning to those who intend to repeat the experiment that they should look exactly to the electrical condition of the apparatus which they have employed.

In speaking of voltage, we should distinguish between the voltage of the battery upon open circuit and the voltage of the battery upon a closed or operating circuit. This latter voltage is really its effective voltage, and in many cases will be lower than the nominal voltage on open circuit. We might have a battery giving 35 or 40 volts on open circuit, but when tested upon a closed circuit the voltage might be reduced to 5 or less. This may account for the discrepancies in the voltage noted in the discussion, but it is a vital point and should be carefully looked to.

I think Dr. Kenefick, from the results which he has obtained, must have employed a very happy arrangement of circuits, but from my knowledge of currents obtainable from dynamos I should not wish to have such a current applied to my ear. I think by all means, for such delicate operations as this, we should have a battery under our own control, the total output of which could not do any harm. I think Dr. Newman's idea of having one of the electrodes in the hand, thus nicely interposing a very large resistance, is not a bad one, especially where sources of current of large possible output are employed. This large resistance would tend to keep down currents below the dangerous limits. Some one has spoken of the melting of electrodes. If such a thing could happen, this extra resistance of the body would prevent it.

In using a battery for such operations as this, its internal resistance should be taken into account. A battery with a high internal resistance would give the same voltage on open circuit as a battery of the same number of cells having a low internal resistance, but upon a closed circuit—that is, when applied to the patient, the effective voltage of the high-resistance battery would be much lower than that of the low-resistance battery. Thus, in an operation calling for a given voltage, measurements made upon open circuit would indicate that that voltage had been obtained, but when actual work is being done the voltage might be very different and discordant results would be obtained, and failure might be reported, which would be laid up against the operation itself, although really due to defective electrical circuits.

Five milliampères seem to be the current required for this operation. This current can be obtained with a high voltage or a low voltage. If a high voltage is employed, as much of the resistance of the body as necessary must be interposed in order to reduce the current to its proper strength. Where a low voltage is employed, less body resistance must be used. Thus if one pole of the battery were placed in the ear and the other pole attached to a napkin wet with a conducting solution and wrapped around the neck, it would be an arrangement permitting the employment of the minimum number of volts. Consequently a smaller battery might be employed, which might be of advantage where portability is to be considered. The use of a low voltage battery would also diminish the tendency to giving shocks.

I have been impressed with the vagueness of the electrical data given in this discussion, and feel that where failure is reported from this operation it cannot be ascribed to the method itself until it has been rigorously demonstrated that the proper electrical methods have been followed.

Dr. J. A. KENEFICK—Concluding remarks: One thing I forgot to say was that this is a substance made of ether and celluloid by the celluloid manufacturers, which they claim will coat and insulate the bougie. It is insulated by simply dipping it into the solution. The objection to it in my mind is that it is liable to crack off within the tube.

Dr. Simpson asked about the length of the bougie. To my mind the proper length is $1\frac{3}{4}$ inches beyond the end of the catheter. He asked when we know that we are in the tympanic cavity. I said one ought in time to acquire such a touch that he would know by the length of the wire and feeling of it just where he is. I have already described the feeling of the end of the bougie in the tympanic cavity.

In regard to Mr. Carty's suggestion as to the apparatus, we must say we accept the apparatus from the instrument makers and expect it to do what they claim it does.

With regard to the size of the bougie, various sizes were used at first as a matter of convenience, but we found by experience that by the smaller-sized bougie we can get in easier than by a larger one. We now use a bougie of one *mm*, and find that that answers the purpose for most cases.

So much has been said that I cannot expect to cover the whole ground.

As to Dr. Gruening, I answer his criticism by invitation to the clinic where he may inspect not only the histories but the patients also.

REPORT OF THE MEETING, FEBRUARY 13, 1901.

DR. J. A. KENEFICK, ACTING SECRETARY.

DR. J. F. MC KERNON, PRESIDENT, IN THE CHAIR.

Anchylosis of incus and malleus in non-suppurative case.

Dr. W. C. PHILLIPS: This specimen, removed from a cadaver at the Post-Graduate Hospital, is interesting in that there is anchylosis of the articulation between the malleus and incus, although the case was not a suppurative one. The drum was intact. There is rather firm anchylosis between the two ossicles.

Discussion.—Dr. E. B. DENCH: The specimen is very interesting, as anchylosis of the ossicles is not often found in non-suppurative cases. In the suppurative cases the condition is of common occurrence. In operating on those cases the point to remember is to carefully examine the dead bone removed from the tympanum, as both ossicles may come away together.

The early operative treatment of acute mastoid inflammation. By E. B. DENCH, M.D.

Among symptoms of mastoid involvement which Dr. Dench especially brought forward is a considerable rise of temperature in children, while fever in adults is of little value in determining the presence of mastoid involvement. In adults, sleeplessness is one of the most important symptoms.

The first step in the treatment is early and free incision of the membrana tympani, extending into canal. This can best be done under nitrous oxide anæsthesia. If, after a few days, tenderness does not disappear, the mastoid should be opened. Abortive methods are unsatisfactory. Ice applications have been given up, as they conceal the symptoms. Local blood-letting is absolutely contraindicated; it temporarily diminishes pain but does not abort the process. Symptoms warranting an operation are, first, local tenderness, which is the most constant and important. It is usually situated over the antrum; when over the tip it is not of equal significance. Second, a narrowness of the meatus,

which is an exceedingly grave symptom. If these two are combined, operation is demanded. The writer advocates a complete operation, always fully exposing the antrum and establishing a free communication with the middle ear. A large opening in mastoid should be made, to better explore all pneumatic spaces, and possible intracranial extension ; if bleeding from sinus occur it can then be better dealt with. All soft bone should be removed. Owing to the rapid course taken by mastoid involvement, and as infection of intracranial structures may follow, Dr. Dench is in favor of an early operation and in limiting abortive measures to the cases seen in the earliest stages. In well-marked mastoid tenderness and narrowing of the meatus, instead of cold and blood abstraction put the patient to bed and watch for 24 to 48 hours. If condition has not changed, operation is warranted.

Discussion.—Dr. J. O. TANSLEY : I agree with Dr. Dench that the external applications of cold and the administration of opiates may mislead, as they mask the true state of affairs. I see no contraindication to the operation save a cosmetic one. This may not seem a very weighty objection, but it means a good deal in the case of a female patient. In order to avoid these bad disfigurements which often occur, I have adopted a plan which has given me considerable satisfaction and success. After having finished the operation, and smoothed down the walls and edges of the bone cavity with chisel or burr, I remove one third or one half of the posterior wall of the canal, so that in the subsequent healing and cicatrization the auricle will be drawn backwards and closer to the head, thus covering the unsightly scar.

I would like to hear the opinion of the members present in regard to this procedure.

Dr. TALBOT R. CHAMBERS : One feels rather diffident about disagreeing with the author, but I think that some of his statements are somewhat sweeping. I would like to ask him whether he has ever used very hot water in the treatment of these cases. I use it at a temperature of 120° to 130° F., by means of the Wilson ear-douche, for fifteen minutes at a time. When Dr. Dench makes the statement that the disease cannot be aborted by hot water when there is pain on pressure at the tip and slight swelling of the canal, and when he says that operation is absolutely indicated in such cases, I feel justified in stating that in a great many cases the disease *can* be aborted by the use of very hot water, as I have described. The double-current Wilson

douche is essential, especially in the case of a child, for otherwise the cheek will be burned by water at such a high temperature as I think it necessary to use. It is not my intention to give a résumé of the treatment I employ, but merely to emphasize the fact that water of a temperature of 120° to 130° F. is of great value in treating these cases.

In regard to Dr. Tansley's statement that the mastoid operation is always followed by an unsightly scar behind the ear, I would say that I have many patients upon whom the operation was done who show only a faint line where the incision was made. I do not see any reason why an opening should remain as a result of the operation.

Dr. W. H. BATES: I have greatly enjoyed Dr. Dench's paper and only rise because it has brought home to me some problems which interest me very much. I believe, as does the author, that, when the mastoid is involved and the external auditory canal is swollen, an external operation on the mastoid is necessary. This belief I have held for a long time. But I have had patients with purulent otitis in whom these symptoms were present, in whom the mastoid was tender, and in whom fluctuation made certain the presence of pus, but who refused operation and recovered without it. I recall in particular one case of acute purulent otitis, that of a man forty years of age, who had had tenderness and swelling over the mastoid for two weeks. He had a temperature of 102° F., complained of chills, and at times had terrible pain. Leeches were applied, also hot flaxseed poultices, and he improved. Later I advised operation, but it was refused. The tenderness and swelling over the mastoid persisted for three weeks. The man recovered without operation.

Perhaps some of the members may remember having read in the *New York Medical Journal* last fall the report of a case of acute purulent otitis referred to me by Dr. Harrigan, in which a diagnosis of mastoiditis had been made by three physicians. Swelling, redness, and fluctuation were present over the mastoid. For about a month there had been pain and temperature. I advised operation, but this was refused. The patient was treated by the family physician and recovered without operation.

At my clinic I frequently see cases of mastoid disease, complicating purulent otitis, in which not only tenderness over the mastoid, temperature, and pain are present, but also swelling, yet recovery has often followed without any treatment whatever.

Dr. ADOLPH RUPP : I am sorry I did not hear the first part of the paper in which Dr. Dench spoke of the diagnostic signs which decide for operation in cases of acute mastoiditis. I had the good—or bad—fortune to have been Dr. Sexton's assistant for several years at the New York Eye and Ear Infirmary, and although Sexton did not operate often, the grave accidents predicted of acute mastoiditis were not seen at his clinic. Later on, Sexton operated oftener in such cases as he had formerly allowed to go unoperated. In general practice one does not see many cases of acute mastoiditis that call for immediate operation, but a large number comparatively with tenderness and swelling behind the ear, and slight fever present. These signs and symptoms disappeared in the majority of cases under proper general and local treatment. The general practitioner is slow to accept expert advice when based on views so radical as those urged by Dr. Dench, because he sees cases recover without operation, although the patients had presented the signs and symptoms laid down as indicating imperative operation. In my cases of acute mastoiditis I am guided by the same principles that guide me in cases of acute appendicitis, which in this respect are analogous, as has been said by Dr Dench. In neither instance is operation in all cases imperative. In both instances the general condition of the patient, as well as the local manifestations, must be considered. In saying this I am not advising against operation in acute mastoiditis, I am merely mildly protesting against a too radical and indiscriminate insistence for operation. If we look over the literature of mastoid disease before and after bacteriology came to the front, we will see that this had much to do with encouraging early operations. And yet when operations are done in some apparently fulminant cases, and the operation thoroughly done, pus has not been found, but only acutely inflamed bone throughout.

Dr. PHILLIPS: It seems to me from the discussion that Dr. Dench's statements have been misunderstood. Dr. Dench has taken a conservative position in regard to the treatment of these cases. I am fully in accord with him, if I understand him to say that he advises operation and early operation in cases in which there is well-marked suppuration of the mastoid cells. More and more I have come to believe that there should be some definite limit to palliative treatment. I will report later on in my paper a case in which operation was postponed too long. We may err in

delaying operation more frequently than in operating too soon on cases of well-defined suppuration of the mastoid cells.

In cases in which the symptoms are such that one feels sure there is pus in the cells, the ice coil and other preventions are contraindicated. There are, of course, certain cases which come to us at an early stage where congestion or inflammation only exists, in which we should resort to palliative treatment. Any routine treatment in connection with all cases is to be condemned. Each case should be a law unto itself. Theoretically hot applications or poultices are contraindicated, but in actual practice they seem to do good in many cases. There is nothing that can take the place of hot irrigation in the early stages, both before and after free opening of the drum. As to the ice coil, it is useful, but dangerous—that is, it is dangerous to use it too long; for from twenty-four to thirty-six, or, at the most, forty-eight hours, it will do good in proper cases, but it should not be employed longer than this. Last week a patient with mastoid symptoms was admitted to my service at the Manhattan Eye and Ear Hospital. An ice coil was applied and allowed to remain for thirty-six hours. It was removed at 5 P.M., and at 10 P.M. the patient's temperature had reached 104° F. Patient was immediately operated upon. The whole interior of the mastoid was involved in necrosis. Clearly the ice coil did no good in this case.

Prolonged tenderness over the region of the antrum lasting for more than three or four days, together with bulging in the attic region, are symptoms marking the necessity for operative interference.

My experience in grip cases has been somewhat different from that of Dr. Dench. In such cases I have found that the process has been more rapid and destructive.

Dr. JAMES F. MCKERNON: I differ from some of the speakers in reference to the use of cold in these cases. I have used the coil with success, putting it on and removing it at intervals to note the effect. I do not think that any one would put it on if pus was present in the mastoid. In acute otitis, when pain on pressure shows involvement of the mastoid antrum, and perhaps of the cells, it does arrest a further involvement of these structures, for the majority of these cases get well without coming to operation, and the hearing remains perfect. I wish to say that possibly the rest does this quite as much as the cold application. It is a fine point to know when to apply the ice coil and when to leave

it off. When it is employed, it should be removed at the end of twenty-four hours. I shall continue to use the ice coil in cases of mastoid tenderness with absence of a prolapse of the posterior superior canal wall until such time as I have reason for abandoning it. So far as the radical operation is concerned, I am in accord with the writer of the paper, and believe that the mastoid cells and the tip should be removed at one sitting; otherwise a secondary operation will be necessary.

Dr. DENCH: I am much pleased at the amount of discussion which my paper has brought out. In regard to diagnostic signs, I distinctly said that in young infants high temperature was an important diagnostic point. In adults it is of no importance. If I find temperature, pain, and tenderness over the mastoid, I do not delay operation.

In regard to the cosmetic effect of the operation, it is true that the complete operation does, at times, leave a large scar behind the ear. We must take that chance, but, if the surgeon is careful, and if he follows the suggestion of Dr. Tansley and removes a portion of the posterior wall, the chances of a resulting deformity are greatly lessened. The suggestion is a valuable one. Moreover, you can avoid the deformity somewhat by making the incision nearer the ear. This does away with a large anterior flap, which, on account of its blood-supply, becomes rapidly swollen and so displaced as to make a bad scar. The scar is also nearer the ear, and not so visible as when a large anterior flap is made.

In regard to tip tenderness, I must have been misunderstood. I did not say that I operated upon every case in which there was tenderness at the tip. I said that in every case seen this year, occurring after grip, there was tip tenderness. I also said that if there was tip tenderness and narrowing of the canal, I would operate. Tenderness of the tip is not so significant as tenderness over the antrum.

With reference to the use of hot water, I have not had much experience with it. When I have used it I have found that it was very painful. It may give the patient relief, but I do not believe that it aborts the mastoiditis, although it may facilitate discharge from the middle ear.

In regard to the criticism about not entering the antrum, I said that in every case I invariably enter the antrum.

As to the cases cited by Dr. Bates, in which there was a fluctuating swelling behind the ear, and the patient recovered, I do not

see how, if pus were present, it could have been absorbed. I am more inclined to think that an error in diagnosis was made. Patients with pus either in the antrum or under the periosteum will not get well unless it is evacuated.

In reply to Dr. Rupp I would make the same statement.

During an assistant-surgeonship of three years I saw only one case of mastoiditis operated upon. If you will now refer to the records of Mt. Sinai Hospital, where they were doing the mastoid operation, at this time, you will find that from eighty to a hundred cases were operated upon each year. The operation is now performed at the Eye and Ear Infirmary, and the records show a large number of cases operated upon each year. Patients are going to the dispensaries where the mastoid operation is being done. During the three years of which I speak, I do not think my chief operated upon a single case. Now we are operating upon from one to two hundred cases a year. I do not think that mastoiditis has increased. The figures simply mean that patients go to our hospital now because they are operated upon, and that formerly they went to other hospitals where the operation was done in these cases.

With reference to what Dr. Phillips has said, I agree with him in the main. Hot irrigation and the use of poultices, especially the latter, I do not approve of; nor do I consider them abortive measures.

With regard to the remark made by Dr. Meierhoff to the effect that cold applications are painful in some cases, I would say that when the pain is neuralgic cold will be painful; when it is inflammatory, cold applications will relieve pain.

Report of a case of acute otitis media, cerebellar abscess; operation; death from meningitis. By Dr. WENDELL C. PHILLIPS. (Published in full in this issue, p. 85.)

Discussion.—Dr. DENCH: We are all indebted to Dr. Phillips for the report of this interesting case. One or two points impressed me: first, the frequent irrigation of the abscess cavity. It has never seemed to me wise to irrigate cases of this kind after the cavity has been thoroughly cleared out. Dr. Phillips says that in this case the cavity was irrigated every two hours, night and day. Is there any advantage in irrigating so frequently? Personally, I have been afraid of irrigating too early for fear that the fluid may infect neighboring tissue and that the force of the stream may break down the limiting membrane and infect healthy cerebral

substance. I also feel the same way about using gauze packing, and am of the opinion that the introduction of a tube is the best treatment for these cases. In the cases which I have lost gauze packing was used. Another method of treating these cases, which was suggested by Dr. Hartley, consists in lining the cavity, after all broken-down tissue has been removed, with rubber protective tissue, carrying the protective well back into the cavity, and filling it with a packing of sterile gauze. As the cavity contracts, the gauze is removed gradually and without lacerating the wall of the cavity.

The second point in regard to operating on these cases is the importance of introducing the finger into the bottom of the cavity in order to make sure that nothing remains. A great many surgeons do not carry out this procedure, which was suggested by Von Bergmann and carried out by him with the best results in his work in brain surgery. I have operated on five or six of these cases, only one of which was successful. By thus introducing the finger one can break down necrotic brain tissue with much less danger to the surrounding tissue than by the introduction of an instrument or by irrigation.

Dr. McKernon: A year and a half ago I had two cases of cerebellar abscess under my care. In these cases the cavity was irrigated every forty-eight hours with a saline solution and packed with gauze. Both patients made a good recovery. I also had a case of abscess of the temporo-sphenoidal lobe, in which the same treatment was employed with success. I would like very much to try the method spoken of by Dr. Dench,—that is, lining the cavity with rubber tissue. So far I have had no bad results from irrigating in these cases. On the contrary, the circulation seemed to improve and the edges of the sloughing tissue cleared up and looked better.

Dr. Phillips: In reply to Dr. Dench I would say that I did not introduce my finger into the cavity of the abscess in the case reported. The operation was performed without an anæsthetic, and I was obliged to be as gentle as possible.

In regard to the frequent irrigations, these were employed as a result of consultation with other surgeons. My idea was to keep the pressure altogether away from the brain. The tube employed was a perforated drainage-tube, and as the fluid was injected the pus welled out. Good drainage was my sole idea, and this is why I followed out this plan.

REPORT ON THE PROGRESS IN OTOLOGY FOR THE THIRD QUARTER OF 1900.

By Dr. A. HARTMANN.

Translated by Dr. Arnold Knapp.

GENERAL.

a.—REPORTS AND GENERAL COMMUNICATIONS.

193. **Bürkner.** Report of the policlinic for diseases of the ear and nose in Göttingen during 1898 and 1899. *Arch. f. Ohrenheilk.*, vol. xlix., p. 250.

194. **Stetter.** Experiences in the field of ear, nose, throat, and mouth diseases. *Monatsch. f. Ohrenheilk.*, Nos. 3 and 4, 1900.

195. **Bing.** Prophylaxis in otology. *Handbuch der Prophylaxe*, part viii., Munich, 1900.

196. **Gerber.** Rules of prevention in ear disease. S. Karger, Berlin, 1900.

197. **Gerber.** Origin and prevention of ear diseases. *Ibid.*

193. The results obtained with the use of various new medicinal agents are worthy of note. Formalin, twenty drops to the litre of water, was used in irrigating chronic suppurations of the middle ear. The results were as satisfactory as with cresol pur. liquef. Nosophen was employed in nose work, after cauterization, in hypersecretion and as a deodorant. Eudoxin, the bismuth salt of nosophen, has a similar action. Protargol and amyloform have been disappointing. Naftalin has been useful in eczema of the ear and nose. Bloch.

194. The report contains the observation of a case of epithelioma originating at the site of the wound for an ear-ring. A patient who practised passing the catheter and bougie succeeded in perforating the drum with the latter instrument. Killian.

195. A very complete description of the rules of prophylactic value in the affections of the various parts of the ear.

Hartmann.

196–7. The rules set forth by GERBER chiefly apply to the nose and mouth. Without the advice of a physician, a nasal or aural syringe should not be used; one side of the nose should be blown at one time only. The removal of the tonsil or the incision of the drum is without danger. If medical advice is not obtainable in pain in the ear, six leeches should be applied near the ear (!). In the second pamphlet these rules are more fully explained. HARTMANN.

b.—GENERAL SYMPTOMATOLOGY AND PATHOLOGY.

198. **Müller.** Objectively perceived entotic noises without annoyance. *Aerztl. Sachverständigen-Zeitung*, No. 10, 1900.

199. **Krotz.** Disturbances of sight and hearing, and paralysis of the ocular muscles after head injuries. *Wiener med. Presse*, No. 32, 1900.

200. **Eitelberg.** What connection has agaraphobia to certain diseases of the ear? *Wiener med. Presse*, Nos. 27–29, 1900.

198. MÜLLER's patient experienced a rhythmic, clacking noise in the right ear. The noise was continuous and synchronous with the pulse. Pressure on the cervical vessels caused it to cease. The noise was not troublesome. A similar noise in the left ear disappeared after an otitis media. The site of the origin or seat of the lesion could not be determined. HARTMANN.

199. In eleven of KROTZ's cases disturbances in the eye and in the ear of the same side were present. The fractures involved the optic canal, the ethmoid bone, the supraorbital fissure, and the temporal bone. POLLAK.

200. EITELBERG shows that agaraphobia is not identical with and not dependent on the vertigo observed in diseases of the ear, and only occurs when the organism deteriorates. This took place in a case observed by Eitelberg after the excessive administration of thyroid tablets. POLLAK.

c.—METHODS OF EXAMINATION AND TREATMENT.

201. **Zarniko.** A clean forehead mirror. *Monatschr. f. Ohrenheilk.*, No. 4, 1900.

202. **Kayser.** A tampon forceps. *Monatschr. f. Ohrenheilk.*, No. 8, 1900.

203. **Cordes.** An apparatus to rarefy the air in the external canal with manometric measure of the negative pressure. *Monatschr. f. Ohrenheilk.*, No. 9, 1900.

201. A detachable and washable white forehead band which

is fastened behind. The reflector works on a Kirstein joint and can be taken hold of by means of a detachable and sterilizable double plate. KILLIAN.

202. KAYSER's forceps winds the cotton on the cotton carrier to form the tampon. KILLIAN.

203. The rarefaction of the air is effected by a suction pump which is worked by a toothed winder. The degree of negative pressure is recorded by the manometer. Scleroses, chronic catarrhs, and sequelæ are treated with benefit. Simultaneously the air is rarefied by the catheter. KILLIAN.

d.—DEAF-MUTISM.

204. **Bogdanow-Beresowski.** On the restoration of hearing in deaf-mutes. *Wratsch*, No. 20, 1900.

204. After a complete review of the literature, and especially of Bezold's and Urbantschitsch's excellent investigations, the author reports his results with hearing exercises in deaf-mutes, in all, eleven patients. The results are in general quite satisfactory. SACHER.

EXTERNAL EAR.

205. **Bentowin.** The dangers of perforating the lobule. *Eschenedelnik*, No. 37, 1900.

206. **Jurgens.** Parotitis in connection with diseases of the canal. *Monatsch. f. Ohrenhlk.*, No. 7, 1900.

207. **Church, B. F.** A tick in a man's ear for two years. *Laryngoscope*, July, 1900.

205. After perforating the lobule for an ear-ring, in a girl ten years old, herpes tonsurans circumscripta set in. SACHER.

206. The autopsy in a case of bilateral parotitis, observed by JURGENS, showed: suppuration of the left gland, with extension to the outer and middle ear, septico-pyæmia with multiple disease of the viscera. KILLIAN.

207. Two years ago severe pain of a clawing or scratching character was felt in the right ear. Masses of what seemed to be blood clots mixed with cerumen were frequently removed from the auditory canal. Later the pain became continuous, extending over the mastoid region.

After an accumulation of wax and epithelium was removed, close inspection revealed several moving bodies, like maggots,

perforating a bulging drumhead. The mass was removed with forceps and found to be a large, live tick, which was embedded in a sulcus against the drum-membrane. The drum was eroded, but not perforated. J. B. CLEMENS.

MIDDLE EAR.

a.—ACUTE OTITIS MEDIA.

208. **Piffl.** Acute otitis media and its treatment. *Prager med. Wochenschr.*, Nos. 21–24, 1900.

209. **Kadzich.** Symptomatology of otitis media in influenza. *Medicinskoje Obosvenje*, April, 1900.

210. **Roosa, D. B. St. John.** The early treatment of acute aural disease. *The Post-Graduate*, June, 1900.

211. **Wilson, Norton L.** Acute otitis media. *The Medical Age*, July 10, 1900.

212. **Keiper, Geo. F.** Report of a case of double mastoiditis ; operation ; recovery. *Stylus* (St. Louis), July, 1900.

213. **McKernon, James F.** The abortive treatment of acute mastoiditis. *The New York Med. News*, August 25, 1900.

214. **White, Faulder.** Mastoid abscess in the absence of middle-ear disease. *Brit. Med. Journal*, Oct. 20, 1900.

208. This is an exhaustive paper, read before general practitioners. The treatment advocated is the one practised at the German Ear Clinic at Prague. According to Zaufal, this disease runs a cyclic course, with sudden onset, and decreases on the seventh or eighth day by crisis or lysis ; in general the course is more rapid and favorable if no perforation of the drum-membrane takes place. Treatment, therefore, should be directed to relieve the pain, and, if possible, prevent the spontaneous perforation of the drum and render the artificial perforation (paracentesis) unnecessary. If the perforation nevertheless does take place, a secondary infection from the auditory canal and the Eustachian tube is more likely to occur, making the acute process a chronic one and protracting the course of the disease. After perforation the possibility of cholesteatoma is also given.

Treatment consists in rest in bed, application of hot alum. acetat. solution, sod. salicylat. 0.5 *g.* every two hours, and painting of iodine about the ear. Paracentesis is then rarely necessary. In 1896, only 10 paracenteses had to be performed among 482 cases of acute otitis media. If the fever and pain have not diminished or have increased on the seventh or eighth day,

paracentesis should be performed. In children, where an acute otitis media seems to be the only explanation for a severe general affection, or in the presence of a complication, paracentesis is indicated. After perforation, strict asepsis is necessary to guard against secondary infection. Profuse discharges are removed by irrigation ; in slight discharge powders may be used. The nose and naso-pharynx are to be treated if necessary. After the cessation of discharge and inflammatory symptoms, if hearing does not return of itself, the various methods for improving the hearing and massage after Zaufal are recommended. PIFFL.

209. Otitis following influenza is frequently associated with severe neuralgic pain in the region of the trigeminus. In a case of the author's, the neuralgic pain persisted for three weeks after paracentesis. Ear-pain continuing after paracentesis may be classified as follows : 1. Pain from collection of pus. 2. Pain, especially nocturnal, due to a lesion of the periosteal mucous membrane. 3. Pain due to mastoiditis. 4. Neuralgic pain. The last sets in periodically and in short attacks, and is localized in the branches of the auriculo-temporal nerve. It is not dependent on the aural lesion, but is a symptom of the influenza toxæmia. SACHER.

210. If a diagnosis of an acute middle-ear inflammation can be made within a few hours of its origin, the free use of hot water, of a temperature from 90° to 100° F., can generally be depended on to subdue it. The irrigations should be repeated every fifteen minutes or every half-hour until the pain ceases, and from one pint to one quart of water should be used at each douching. Should this fail to relieve the pain within a reasonable time, the application of leeches upon the tragus is advised. A Wilde's incision is considered a better evacuant for a red, tender, and swollen mastoid.

Should these antiphlogistic measures be unavailing, it will then be time enough to consider paracentesis. ROOSA strongly denounces *early* paracentesis and would only make use of it where there is excessive bulging of the membrana tympani. Where the inflammatory process has not gone on to suppuration, there is too much danger of infecting the cavity of the tympanum by it. He thinks that many a case has been converted into a serious one by an unnecessary paracentesis. A spontaneous rupture is to be preferred to too early an opening with the knife.

To keep the ear in an aseptic condition, douchings of hot,

sterilized water are more relied upon than the use of medicinal antiseptics. Upon a subsidence of the acute symptoms, inflation by Politzer's method is practised. Due attention is bestowed upon the nose and throat where necessary.

Infants suffering with earache in the night can be relieved by breathing frequently in the ear. J. B. CLEMENS.

211. WILSON finds that the most satisfactory treatment in these cases is small doses of calomel, leeches in front of the tragus, and hot-water irrigations. The fountain syringe used for this purpose has a return-flow bulb attachment, permitting the water to flow out without removing the tip.

J. B. CLEMENS.

212. A case of double mastoiditis, due to an extension of otitis media suppurativa in both ears. The mastoid integument was swollen and painful, with considerable lapping of both auricles. The mastoid operation was first performed on the right side, in which much pus and carious bone were found and removed. The pathological condition of the left mastoid was quite the same as the right. A right facial paralysis, noticed shortly after the operation, was due to excessive packing.

The following day surgical erysipelas developed in both wounds. Under appropriate treatment the case made a satisfactory recovery.

J. B. CLEMENS.

213. This paper is a refutation of the doctrine that the only rational means of aborting acute mastoiditis is to apply moist and dry heat over the mastoid and around the ear. MCKERNON thoroughly studied and tested the effect of heat in aborting acute mastoiditis in a series of ten cases, four of which occurred in children under eight years of age, and six in adults. The results were unsatisfactory in each and every case, and he condemns its use for this purpose as ineffective. Heat appears to diminish or stop the pain, but at the expense of softening the tissues beneath, thereby aiding and advancing the inflammatory process. He advocates the use of cold by Leiter's ice coil, which must be applied snugly over the mastoid surface, and kept so. At the same time a purgative is given, and the ear is irrigated with bichloride solution 1:4000. In cases where there is insufficient drainage, a free paracentesis of the most bulging part of the drum and canal is made. Generally after twenty-four to thirty-six hours this method has produced flattering results in his hands.

J. B. CLEMENS.

214. A man aged seventy, in January, 1899, after sitting in a draught at church, felt intense pain in the right ear. The pain continued until August. The hearing was unaffected, and there was no discharge. WHITE did not see him until August 20th. There was then mastoid trouble, which necessitated operation. A disc of bone was removed with the trephine, and a cavity the size of a walnut was found, containing inoffensive pus. Recovery.

White thinks that the case was one of simple abscess of the mastoid, due to cold; a conclusion which, it seems, he was hardly justified in drawing from the data given.

ARTHUR H. CHEATLE.

b.—CHRONIC PURULENT OTITIS.

215. **Gomperz.** The treatment of adhesions in the middle ear. *Wien. medic. Wochensch.*, Nos. 33–35, 1900.

216. **Mendoza.** A new, rapid, and certain method of exposing the middle-ear cavities. *Arch. Internat. de Laryng., d'otol.*, etc., vol. xiii., No. 3.

217. **Gläser.** Results on 57 mastoid operations in chronic purulent otitis. Dissertation, Breslau, 1900.

218. **Brieger.** On the operative treatment of chronic purulent otitis. *Breslauer Statistik*, xx., 1, 1900.

219. **Fagge, C. H.** On the treatment of chronic middle-ear suppuration by removal of the malleus and incus. *Guy's Hosp. Reports*, 1899.

220. **Wilson, Harry.** A case of mastoid disease, with necrosis and sequestrum of the petrous portion of the temporal bone. *Annals of Otology, Rhinology, and Laryngology*, May, 1900.

215. In adhesion of the drum and malleus to the labyrinthine wall GOMPERZ recommends the interposition of a strip of celluloid paper after division of the adhesion. POLLAK.

216. MENDOZA has devised a dental burr adapted to Stacke's stapes-protector; a special protector (protecteur trépan) guards against injury. SCHWENDT.

217. Of these 57 cases from Kümmel's practice, 22 were healed, 3 nearly healed, and 7 died. HARTMANN.

218. This is an exhaustive and interestingly written study. The indications, operative technic, and subsequent treatment are fully described. ZIMMERMANN.

219. This is a careful paper, giving a résumé of the subject and a record of 15 cases treated by removal of the malleus and incus. ARTHUR H. CHEATLE.

220. The patient had otorrhœa in the right ear, for three or four years, with occasional acute attacks of mastoid pain and tenderness. Prior to the operation the tissues over the mastoid and down the neck were swollen and tender, and there was a fluctuating swelling situated about two inches below the mastoid tip. There was marked right-sided facial paralysis. The usual mastoidectomy was performed and, upon reaching the site of the middle ear, it was found filled with a large, firm, movable body, its surface covered with granulations and bathed in pus. The body was removed and crushed with forceps in the process, and, after being cleaned, the fragments were found to make up practically the entire labyrinthine portion of the temporal bone. There was a normal and uninterrupted recovery.

J. B. CLEMENS.

c.—COMPLICATIONS OF CHRONIC PURULENT OTITIS.

221. **Richards, George L.** A brief report of a case of cerebral abscess of otitic origin; operation; death. *Boston Med. and Surg. Journ.*, Aug. 16, 1900.

222. **Richardson, W. G.** Operation for cerebral abscess; recovery. *Brit. Med. Journ.*, Oct. 20, 1900.

223. **Friedenwald, Harry.** Septic thrombosis of the lateral sinus. *Maryland Med. Journ.*, June, 1900.

224. **Moore, William O.** Acute otitis media supervening on otitis media purulenta chronica. Resulting in necrosis of temporal, occipital, and parietal bones, with closure of the lateral sinus and abscess of cerebellum. *The Post-Graduate*, June, 1900.

225. **Braun.** Demonstration of a brain and left temporal bone of a man, aged twenty-seven, who had been operated on for left-side otitic cerebellar abscess. *Münch. med. Wochenschr.*, No. 29, 1900.

226. **Hammerschlag.** A clinical contribution to the study of meningitis serosa. *Wien. medic. Wochenschr.*, No. 35, 1900.

227. **Scheibe.** Purulent meningitis caused by the bacterium lactis aërogenes (Escherich). *Prag. medic. Wochenschr.*, No. 15, 1900.

228. **Meier.** On air embolism in operations on the sinus. *Arch. f. Ohrenhlk.*, vol. xlix., p. 241.

229. **Lewy.** A contribution on otitic pyæmia. *Monatschr. f. Ohrenheilk.*, No. 9, 1900.

230. **Kokizki.** A case of purulent thrombo-phlebitis of the transverse sinus. *Bolnitschkaja Gaseta Botkina.*, No. 33, 1900.

231. **V. Stein.** A safe method of trephining with a new basket-shaped protector and a new burr. *Centralbe. f. Chirurg.*, No. 19, 1900.

221. The patient, a male twenty-eight years old, had an attack

of acute otitis media in '97, followed by discharge. He was not conscious of any trouble since that time until September, '99 (a period of two years), when, after a hair-cut, he was attacked by pain in the head, loss of appetite, and general weakness. Pain in the right ear was severe with slight discharge. A small perforation was found in the drum. Poultices and douching with hot boric acid solution constituted the local treatment.

In several weeks he recovered sufficiently to leave the hospital and go home. On the way he became dazed and wandered into a swamp, where he was found late that evening. Later he became partly paralyzed on the left side and unconscious. A mastoidectomy was at once performed but no pus was found in the cells; the lateral sinus was uncovered and found healthy. A trephine opening was then made one inch above and behind the bony auditory canal and, at a depth of a quarter of an inch in the substance of the brain, an abscess was evacuated of about two ounces of foul-smelling pus. A broncho-pneumonia shortly developed from which he died. J. B. CLEMENS.

222. At the Northumberland and Durham Medical Society held on October 11, 1900, RICHARDSON showed a case of recovery from cerebellar abscess. The patient was a child aged seven years. It is hoped that full notes will appear in the ARCHIVES. ARTHUR H. CHEATLE.

223. The case reported was that of a man twenty-nine years of age, who had an attack of acute otitis media in the left ear. Early paracentesis failed to relieve the severity of the inflammation. There was later severe and constant pain in the head and neck, with marked mastoid tenderness. The membrana tympani showed redness at this time, but no bulging. Temperature fluctuating. At the operation the mastoid was found to be exceedingly vascular and softened, with much carious bone in the posterior portion of the tip. The operation eased the pain, but the temperature showed a septic rise and fall. At no time was there a suspicion of a chill. About one week after the mastoid operation a sudden rise in temperature to 105.2° F., seemed to point to disease of the sinus. The latter was uncovered at a second operation for two and a half inches, and found to contain a large, solid, dark thrombus in the upper part, while from the lower end escaped much pus. A satisfactory return flow was established from both ends, and the jugular was not ligated. Pus

cultures showed presence of streptococci. The case made a good recovery.

The absence of leucocytosis, and, still more, the absence of chills, make the case of interest. J. B. CLEMENS.

224. The patient had a suppurating ear for three years. In March of the present year, after surf-bathing, severe acute symptoms developed which ultimately led to an acute mastoiditis. A mastoidectomy was refused at this time, so a Wilde's incision was made through the red and swollen mastoid integument, from which no pus escaped. Later the pain and swelling over the mastoid returned, and the cells were opened, followed by an escape of pus. Severe headache, nausea, vomiting, and dizziness occurred later with a septic temperature. Death followed about one month after the mastoidectomy.

Autopsy four hours after death: Extensive caries extending from the mastoid as far as the parieto-occipital and upward to the temporo-parietal suture; an opening was found through this suture leading into the cranial cavity at a level of the lateral sinus. The sinus was like a fibrous cord. The meninges were much congested, especially at the posterior regions. Dura adherent at the posterior third of longitudinal sinus. Pus found in the posterior fossa between the dura and the skull. In the centre of the right lobe of the cerebellum was an abscess the size of a walnut. No pus in the mastoid cells and only a few drops in the tympanum. J. B. CLEMENS.

225. The temporal lobe was first incised; then the abscess in the cerebellum was found and evacuated. Death after thirty hours. No meningitis, no secondary abscess. Necrosis of bone in posterior surface of the petrous pyramid. SCHEIBE.

226. HAMMERSCHLAG successfully operated on two cases where, following a chronic purulent otitis, severe meningeal symptoms supervened. In both cases the operation revealed a circumscribed external pachymeningitis with caries of the temporal bone. A marked increase in intracranial pressure due to an exudation of a serous fluid into the ventricles is stated as the cause for the severe meningeal symptoms. In the first case lumbar puncture was performed. In the second, the middle and posterior cranial fossæ were exposed, the sinus opened, dura incised, and cerebellum explored. Recovery took place in both.

POLLAK.

227. Autopsy on a female infant eight days old showed the meninges over the brain were distended with a cloudy serous fluid, in places with thick, purulent, yellowish-green exudate; both middle ears contained considerable pus; the nasal mucous membrane was unaffected. The same bacilli were found in the fluid of the meninges, in the pus of the middle ear, and in the nose. SCHEIBE after numerous culture experiments places them in the group of the bacterium lactis aërogenes.

HARTMANN.

228. MEIER reports a case of true air embolism in the transverse sinus with recovery. A patient, twenty-seven years old, was operated on for acute mastoiditis and sinus phlebitis. The wall of the sinus was accidentally injured by a chip of bone. As this was removed subsequently during the dressing of the wound, a hissing sound in the wound was heard simultaneously by the doctor and patient. The patient collapsed, gasped, became pulseless and blue. Gurgling sounds were heard over the heart. The patient recovered completely after fifteen minutes. To prevent similar accidents the author recommends the insertion of a small plug centrally between the bone and sinus wall, then after stroking the blood back, placing another plug peripherally, a procedure which has been suggested before. BLOCH.

229. The patient was a child of five. The sinus appeared normal. The jugular and facial veins were ligated; the high fever, however, continued for five days. Recovery followed.

KILLIAN.

230. A man, aged thirty-seven, suffered pain in the left ear two months ago, after a severe cold. A month later the pain increased in severity and became localized behind the ear. Paracentesis was followed by no discharge and no improvement. On admission the following symptoms were present: Zaufal's dilatation of the cutaneous veins, Bonnel's distinctly circumscribed tenderness about the mastoid emissary, Griesinger's doughy swelling without inflammatory signs, monolateral headache, vertigo, and apathy. The mastoid process was not swollen, the tip only was painful. Optic neuritis. Temperature never over 37.7°, no chills. At the operation, on retracting the periosteum back from the mastoid incision, the bone over the lower knee of the sinus was found softened. In place of the sinus there was an abscess cavity containing half an ounce of pus. The dura was healthy. Copious venous hemorrhage occurred, but was easily checked. Recovery

uneventful. The pus showed presence of staphylococcus pyogenes albus. SACHER.

231. A movable basket-shaped protector fits to the shaft of the drill and prevents its penetrating too deeply. When the skull is opened, a drill is used with a rounded centre and obliquely radiating cutting edges. ZIMMERMANN.

d.—OTHER AFFECTIONS.

232. **Reinhard.** On the etiology of cicatricial strictures at the pharyngeal opening of the tube. *Monatschr. f. Ohrenhlk.*, No. 6, 1900.

233. **Suzár.** Carcinoma of the middle ear, with paralysis of the facial, glosso-pharyngeal, spinal accessory, vagus, and hypoglossal nerves. *Proosi hetilap*, No. 39, 1900.

234. **Fleming, E. W.** Report of a case of fibroma involving the tympanic cavity. *Laryngoscope*, July, 1900.

232. REINHARD has collected several cases from literature and twelve from Schrötter's clinic, where scleroma had caused changes in the tubal ostium. He found that scleroma produces a progressive cicatricial contraction of the pharyngeal opening of the Eustachian tube, with chronic inflammatory changes in the deeper tissues leading to stenosis and displacement of the cartilaginous part with consecutive changes in the ear. Several instructive cases are described in a table. KILLIAN.

233. SUZÁR describes a case of epithelial carcinoma extending to the Fallopian canal and to the surrounding parts of the base of the skull and neck, which compelled and directly involved some of the above-named nerves. Microscopic examination gave carcinoma epitheliale keratodes. POLLAK.

234. The patient, a male aged forty, noticed a fulness in his left ear, which became more intense each day. An examination revealed a fairly solid tumor-like mass growing from the depths of the auditory canal and almost filling the concha. The growth was very rapid, attaining its size in about twelve days; it was slightly movable and highly sensitive to the probe. On account of its size the point of origin could not be detected. A section of the tumor was removed for microscopical examination and it was pronounced to be a true fibroma.

By detaching the auricle from behind and exposing the osseous canal, the tumor was easily excised with a wire ecraseur. It was found growing from the tympanic cavity and posterior osseous

canal. Granulation tissue subsequently developed, which was removed by curette, but the fibroma showed no disposition to recur. J. B. CLEMENS.

NERVOUS APPARATUS.

235. **Moller.** A case of labyrinthine angioneurosis, accompanied with the onset of Ménière's symptoms. *Arch. f. Ohrenhlk.*, vol. xlix., p. 247.

236. **Sternberg.** The so-called tumors of the acoustic nerve. *Zeitschr. f. Heilk.*, vol. xxi., No. 4.

235. A man, aged forty-two, syphilitic, nervous, hypochondriac, suffered after long-continued moderate deafness in the course of several days from a number of short attacks of vertigo with subjective noises, and once with vomiting. After pilocarpine the subjective symptoms improved, especially hearing for whisper. The results of hearing tests make a stapes anchylosis probable. The rapid repetition and change in subjective symptoms favor the diagnosis of angioneurosis. BLOCH.

236. STERNBERG describes five cases of tumors, which were either directly connected with the auditory nerve or had grown into the porus acustic. int. Histologically they proved to be gliofibroma (three cases), sarcoma, or fibroma, and one derived from the dura. Seven additional cases were collected out of the literature, of which three were considered gliomatous, the others principally sarcomata. The generally accepted origin of these tumors from the acoustic nerve does not seem probable to the author, especially as in the case of the mixed tumors of gliomatous nature, the origin appears to take place from embryonal remnants occurring in the region of the dorsal cranial nerves. PIFFL.

(To be continued.)

BOOK REVIEWS.

I. **Rhinology, Laryngology, and Otology, and Their Significance in General Medicine.** By Dr. E. P. FRIEDRICH, of Leipzig. Authorized translation from the German; edited by H. HOLBROOK CURTIS, M.D. Price, $2.50. W. B. Saunders & Co., Philadelphia, 1900.

The book treats of the manner in which the nose, throat, or ear is affected in the course of a general disease. The practitioner in whose mind the general disease is foremost can learn of the local manifestations occurring in these special organs, and will often receive aid to diagnosis from them. The book is of still greater importance to the special worker, for it shows the closely existing connection of many local lesions to affections of the general body, and the interdependence of one organ upon another. It is just this knowledge which prevents the specialist from following out his work along too narrow lines.

The affections of the nose, throat, and ear are described as they occur in the diseases of the respiratory organs, the circulatory system, digestive system, blood, chronic constitutional diseases, infectious diseases, kidney, skin, sexual organs, eye, intoxications, and nervous system, with an appendix on the reflex neuroses.

The information collected in this book is exhaustive and unusually complete; it shows the work of a writer who combines a large clinical experience with a thorough knowledge of the bibliography. It is an excellent and instructive study to all special workers, and furnishes a necessary addition to the standard textbooks. The task of the translator is to be commended. The book is well gotten up; the unnecessary though prevalent practice of adding many pages of advertisements is adhered to.

A. K.

II. **The Year-Book of the Nose, Throat, and Ear.** Edited by Dr. G. P. HEAD and Dr. A. H. ANDREWS. Pp. 416. Price, $2. The Year Book Publishers, 100 State St., Chicago, 1901.

The Year-Book gives a very complete list of the articles dealing with the nose, throat, or ear which have appeared during the past year. Many of these are abstracted, and a reliable picture of the year's progress in these specialties has been furnished. The book is of value not only as a guide to the literature, but as giving the present opinion on many important subjects connected with the nose, throat, and ear. A. K.

MISCELLANEOUS NOTES.

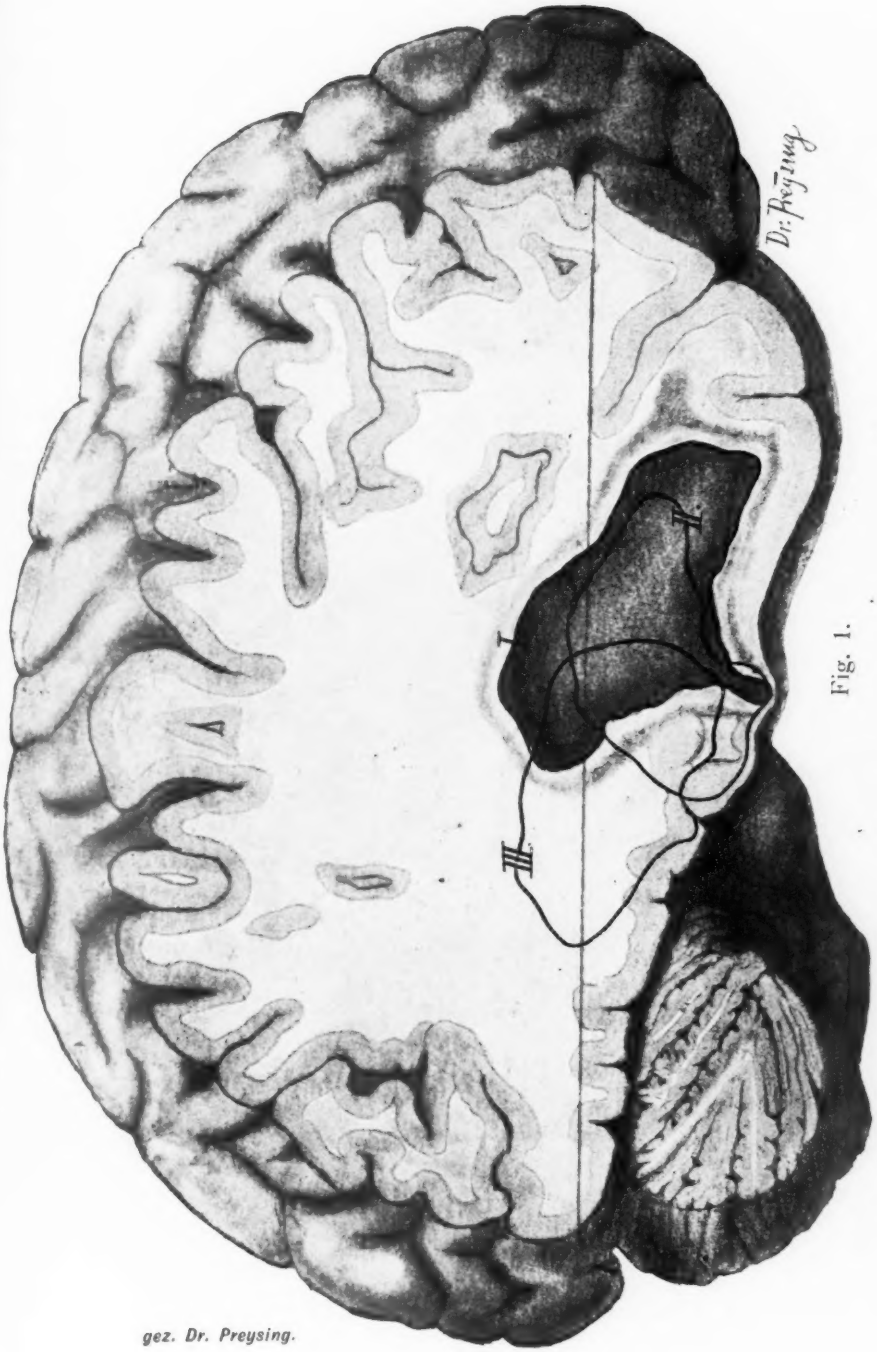
The annual meeting of the American Laryngological, Rhinological, and Otological Society will be held at the N. Y. Academy of Medicine, in New York, May 23, 24, and 25, 1901.

A well-equipped Ear Department has been established in the former building of the Eye Clinic at Jena. There are accommodations for forty patients.

The Seventh International Otological Congress will be held in August or September, 1902, in Bordeaux.

The German Otological Society will meet this year in Breslau, on May 24th and 25th.

Professor Urbantschitsch, of Vienna, has taken the place of the late Professor Gruber on the editorial staff of the *Monatschrift für Ohrenheilkunde.*



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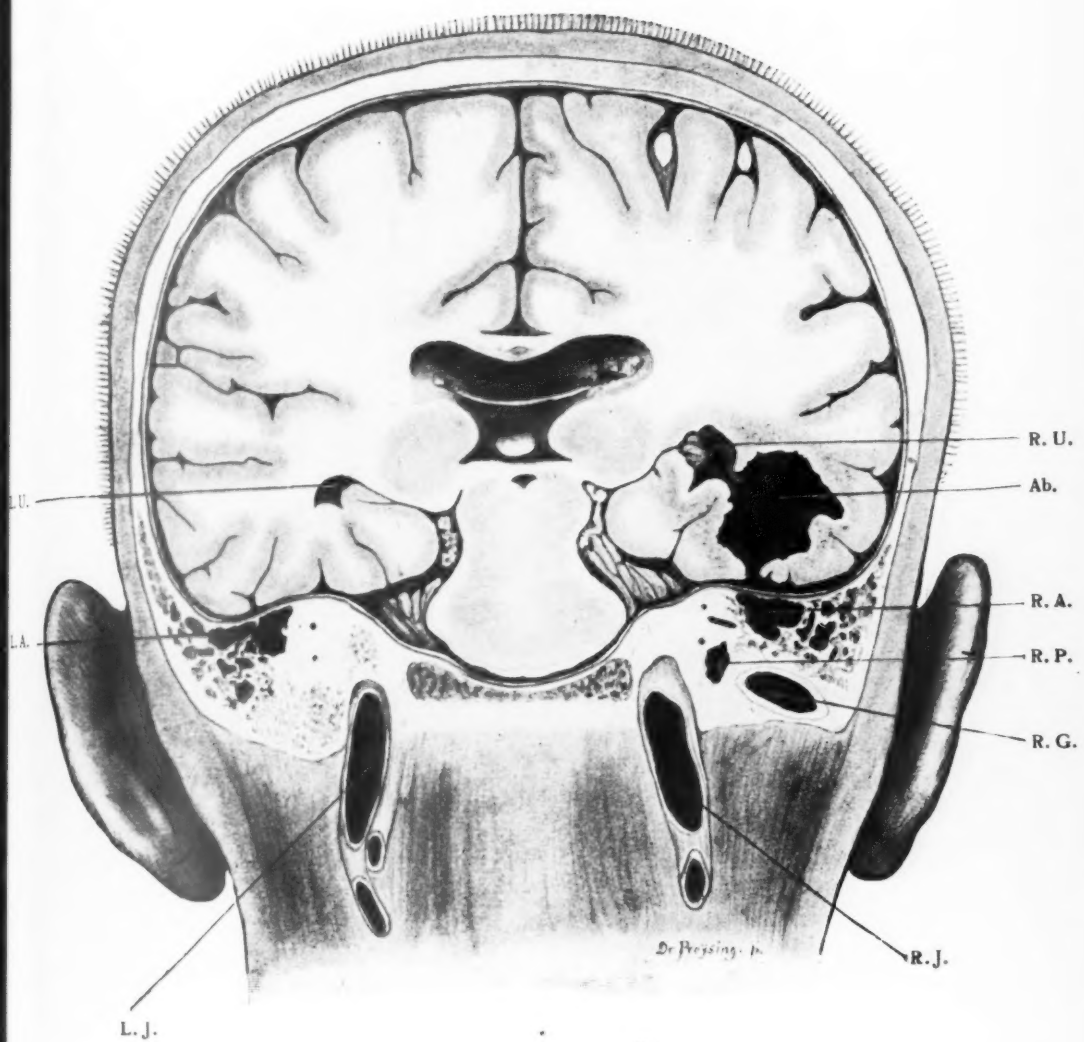

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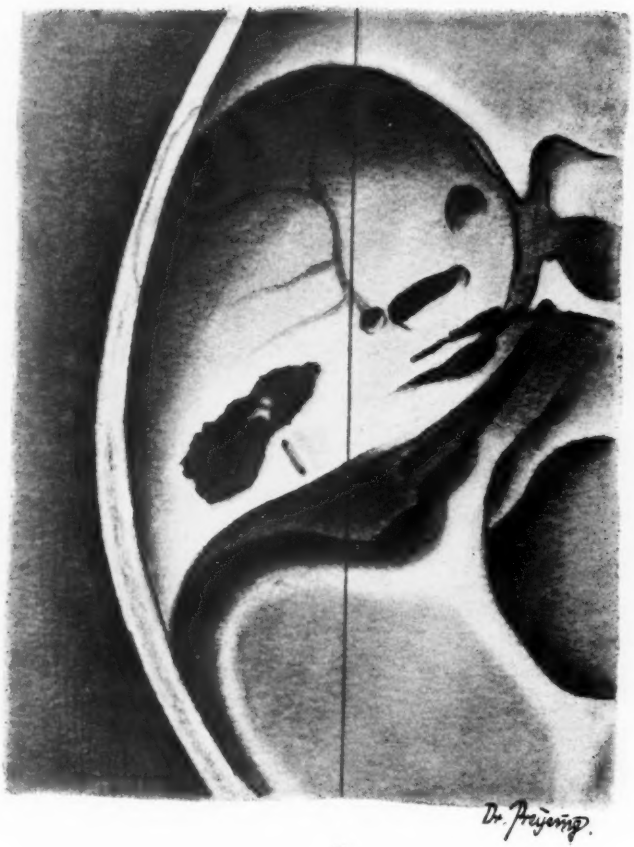

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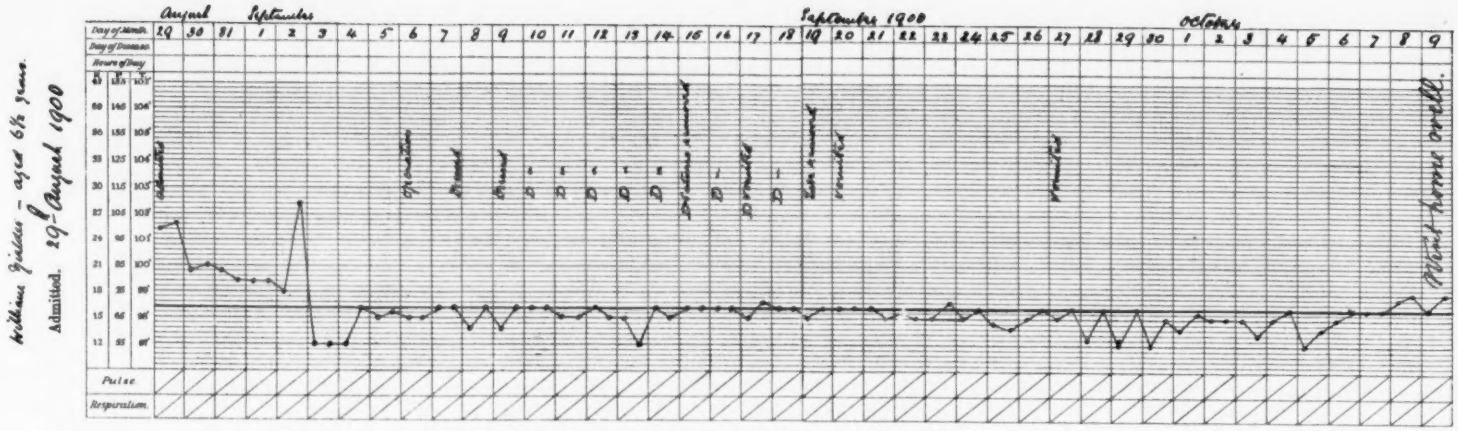

ILLUSTRATING W. G. RICHARDS'S PAPER, "A CASE OF CEREBELLAR ABSCESS."